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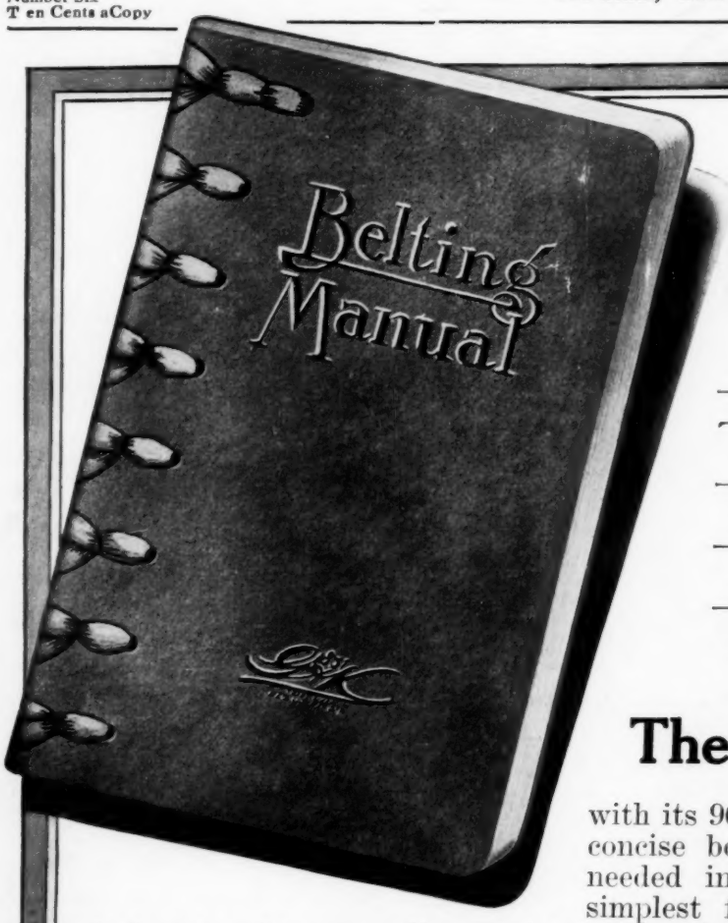


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Table of Contents, page 205. Alphabetical Index to Advertisers, page 78. Classified Index to Advertisers, page 79.

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# COTTON

Published Monthly

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L. L. ARNOLD, Editor

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CONTENTS.


**Editorial—**

What They Need ..... 205
Program for Memphis Convention ..... 206
National Assoication Convention ..... 207
Georgia Cotton Manufacturers ..... 207
The Knit Goods Meeting ..... 207
Southern Commercial Congress ..... 208
Cartoon ..... 209

**General—**

The Rural Control of Congress ..... 210
The Industrial Loom Drive ..... 212
Taking a Time Study ..... 214
Some Advice for Young Men ..... 215
The Health of the Employee ..... 215

**Mill Conditions and Market Reviews—**

Southern Mill Situation ..... 218
New England Mill Situation ..... 220
Cotton Comment ..... 221
The Yarn Market ..... 223
The Knit Goods Market ..... 223

**Cotton Manufacturing—**

Shoe Top Cloth ..... 224
Increasing Mill Efficiency ..... 225
Designs for Fancy Cotton Fabrics ..... 228
A Warp Moistener for Looms ..... 230

**Knitting Department—**

The Manufacture of Fashioned Knit Goods ..... 231
The Manufacture and Finishing of Hosiery ..... 235

**Dyeing, Bleaching and Finishing—**

Bleaching Absorbant Cotton ..... 237

**Notes About Men You Know** ..... 241

**Practical Problems Discussed by Cotton's Readers—**

Another Opinion on Cut Waste ..... 243
Breaking Strength Varies ..... 244
Using the Mote Knife Gauge ..... 245
Further Points on Combing ..... 245
Department Systems ..... 246
Fixing German Loopers ..... 246
Finding the Twist on Mules ..... 246
More Ideas and Efficiency ..... 246
More About Builders ..... 65

**New Machinery and Trade Notes** ..... 66

**Book Reviews** ..... 74

**Knitting Mill News** ..... 76


## WHAT THEY NEED.

Major Thomas Robinson Dawley, Jr., the much maligned author of "The Child That Toileth Not," once said if he were a Carnegie or a Rockefeller seeking to improve the conditions of the poor mountain people, he would build them a cotton mill. This statement was qualified to show that his intent was not to present them with this mill, but to furnish them with occupations of a character suited to their abilities. Is not this suggestion equally applicable to the tenant farmers of Texas and Oklahoma?

The Federal Commission of Industrial Relations while investigating the conditions surrounding these tenant farmers and their families has, according to press reports, developed some facts worthy of notice, a few of which we quote as follows:

> "W. S. Noble, secretary of the Land League of Texas, told the Federal Commission on Industrial relations that he found two land tenants in north Texas so poverty stricken that they were offering to give their children away."
>
> "L. T. Steward, a farmer, whose experience was similar, it is said, to some fifty thousand tenant families in the southwest, then took the witness stand. Alongside sat his wife and six of his eight children, ranging from three to twenty years old. Three of the smallest were barefooted, their feet showing sores from frost bites."
>
> "Mrs. Steward, the mother of eleven children declared her routine was to get breakfast at four in the morning, work in the fields until nearly noon, then return to the house to begin household duties, and take one day out a week to do the washing. For several years she made her husband's clothing, her own and her children's. Asked about farm tenant housing conditions, she said, 'Some houses are tolerably decent, some are not. I have carried water myself half a mile from the nearest well to the house.'"
>
> "Pat Nagle, an attorney of Kingfisher, Okla., editor of The Tenant Farmer, testified that the word *force*, when referring to Oklahoma farm lands does not mean a bowie knife or a pistol, but a battery of children with a woman at their head. To explain what he meant, Nagle then read into the record two letters from a land owner residing near McLain County, Oklahoma, advising that the tenant to go on one of his farms must have plenty of force. He also testified to an eviction of an Oklahoma tenant who was put off the land because he had no children. This tenant was old, Nagle said, and a young farmer with 'a *force* and a young wife' had offered to take the farm if given immediate possession. Nagle offered to give the commission privately the name of the town where he said this eviction was put through by a town court."

"J. Tom Pagitt, owner of 12,000 acres of Texas land, described some tenant problems on his estate from the landowner's point of view. The Pagitt place in Coleman county, he said, had twenty-two tenant families on about 2,000 acres, the remainder being leased to cattlemen. He said his agent prefers to get tenants with large families of children because the country is so sparsely settled that the women and children form almost the only available source of extra labor supply in the cotton picking season. The women among his tenants, he said, usually chop, hoe, and help with picking cotton. Children begin work in the fields at about *eight years of age.* A tenant, he continued, would have difficulty hiring farm hands because he could not, as a rule, pay their wages until after the crop was sold."

Where has the National Child Labor Committee been to let instances like these escape its notice? The number of such cases is reported as running into the hundreds of thousands.

Has not Southern Secretary McKelway "fallen down" on his job by smiting not such cases with his big stick and his facile pen?

Why, oh why, did "staff protographer" Hine confine his "investigations" to the cotton mill districts of North Carolina when such fertile fields for his trusty camera lay to the southwest?

Then there is A. Mitchell Palmer of Pennsylvania, who fathered the national child labor bill in the last Congress, and the 243 congressmen who voted with him; can any of these gentlemen explain why children employed in "agricultural pursuits" were not included within the scope of this bill?

Was it because they were afraid of the *farmer vote* as indicated in these columns last February?

The evidence before this federal commission only substantiates more forcibly the comparatively mild indictment of some Georgia farmers made by Professor E. C. Merry, superintendent of the Fulton county schools and chairman of the special county child labor commission. This evidence is authentic and on record. COTTON invites the attention of the professional gentlemen who have worked so long and so earnestly to handicap the cotton manufacturing industry, to this glorious record of the "horny-handed sons of the soil".

There is no cotton mill community where the people have to walk half a mile for water. Mr. Hine has searched diligently but unsuccessfully to find an eight-year old child in a cotton mill. The children in cotton mill communities are well fed, well clothed, attend school, and do not suffer from frost-bitten toes.

Evidently the tenant farmers of Texas and elsewhere do need cotton mills. Also those philanthropic persons who furnish the funds for the exploiting work of the National Child Labor Committee and similar flaw-picking organizations, need suitable legal protection to prevent the foolish and entirely uncalled for waste of money which could be put to much better advantage in furnishing educational facilities among the poor people who need them. The children at the cotton mills already have such facilities, thanks to the cotton manufacturers; it is the children employed in agricultural pursuits who are the most destitute in this respect, and who, in many instances, are not allowed to take proper advantage of even such facilities as they have.

Many worthy persons are indirectly promoting child labor investigations on the basis of a hired agent's report. It would be ten thousand times better for all concerned if these philanthropists would put such agents at work hoeing potatoes, while they made a personal investigation of mill conditions and surroundings. These people who furnish the money are well meaning people, but they need educating. They are in a position very similar to thousands of children in states having no compulsory education statute, they have the facilities, but they fail to take advantage of them. COTTON will be glad to cooperate with any such persons desiring to secure first hand knowledge and willing to spend the time and money necessary to attain this end.

## PROGRAM FOR MEMPHIS CONVENTION.

The program for the nineteenth annual convention of the American Cotton Manufacturers' Association to be held at Memphis, Tenn., April 13-14 has been announced by Secretary Bryant as follows:

*Tuesday, April 13, 10 A. M.*

Call to order, President T. I. Hickman.

Prayer, Rev. Henry F. Dugan.

Address of Welcome, Hon. E. H. Crump, Mayor of Memphis.

Reply to Address of Welcome.

Announcements.

Annual Address, President T. I. Hickman.

Address, Possible Increased Use of Electrical and Pneumatic Forces in Textile Machinery, Frank Nasmith, Editor Textile Recorder, Manchester, England. To be followed by discussion.

Address, Condition of the Present Dyestuff Situation, E. C. Klipstein. To be followsd by discussion.

Address, General Business Efficiency in Connection with Cotton Mill Management, J. T. Rose, treasurer W. R. C. Smith Publishing Co. To be followed by discussion.

*Evening session, 8 A. M.*

Lecture on South America, with lantern slides, Chas. T. Plunkett.

*Wednesday, April 14, 10 A. M.*

Call to order, President Hickman.

Announcements.

Address, Trade Abuses and a Remedy, Kenneth R. Hooker. Followed by discussion.

Address, Agricultural and Mechanical College Work, Pres. D. H. Hill. Followed by discussion.

Address, The Development of Export Trade in Cotton Goods, M. P. Moseley. Followed by discussion.

Report of committees as follows:

| | |
|---|---|
| Textile Bureau, | Mr. John P. Wood, Director |
| Textile Alliance, | Mr. A. M. Patterson, President |
| National Council, | Mr. Hickman, Chairman |
| Trade Abuses, | Mr. Caesar Cone, Chairman |
| Duke Warehouse Plan, | Mr. S. W. Cremer, Chairman |
| Importance of Foreign Grown Cotton, | Mr. J. H. Separk |
| Foreign Trade Council Meeting, | Mr. James Maynard |
| Tariff and Legislation, | Mr. R. M. Miller, Jr., Chairman |

Report of secretary and treasurer.

Report of committee on resolutions.

New business.

Election of officers.

The entertainment features of the program will be as follows:

*April 13—12:30 P. M.*

Special train to Memphis Terminal Corporation Plant, where in addition to seeing that very large and interesting Cotton Warehouse, a Barbecue de Lux will be given by the Members of the Memphis Cotton Exchange.

*April 14—5 P. M.*

Boat Ride around Memphis Harbor. Refreshments—Music—Cabaret. Returning to Dock about 9 P. M. Special train arrangements will be made for members leaving for the east after the leaving time of the regular trains.

## NATIONAL ASSOCIATION CONVENTION.

The 98th convention of the National Association of Cotton Manufacturers will be held Wednesday and Thursday, April 28 and 29, 1915, at the Copley Plaza, Boston. The first session will be largely given up to the annual address of the president of the association, Albert Greene Duncan, treasurer of the Harmony Mills, to the various reports and the detail business of the association, to be followed by a banquet at 6:30 P. M.

The Thursday morning session will be very largely devoted to a discussion of the most modern uses of reinforced concrete in mill construction and subsidiary construction. This will be followed by lunch in the grill room, and it is proposed to take up at the afternoon session the latest developments of the dyestuff situation, which daily threatens to become more acute. This dyestuff situation is to be the keynote of the meeting.

Concrete construction is a subject which has been discussed at length by mill engineers, and owing to the fact that serious fire losses have occurred in the recent past, the subject of fire protection for textile establishments is particularly apropos for discussion. Many lessons have been drawn from the destruction of the Naumkeag Mills, and the practically total destruction of the Edison works, portions of which were of reinforced concrete construction. These have enabled engineers to accumulate considerable data as to the best methods of erecting mill buildings so that the danger of loss by fire will be very much decreased.

The dyestuff situation is considered by many to be the most serious feature confronting the industry at the present time, as unless supplies of dyestuffs are available, it will mean curtailment in operation of the majority of colored cotton mills.

In addition to papers on this subject arrangements have been made for well-informed men to take active part in the informal discussion. Men prominent in the dye stuff importation business have agreed to attend and discuss the question from their side of the case.

The officers of the Association strongly urge every mill organization to have a representative present to listen to and take part in the informal discussion.

## GEORGIA COTTON MANUFACTURERS.

The fifteenth annual convention of the Cotton Manufacturers' Association of Georgia will be held at the Piedmont Hotel, Atlanta, on Tuesday, May 18th. Arrangements are being made to provide a splendid program and suitable entertainment for the members and guests. Complete announcements will be made later through these columns.

## THE KNIT GOODS MEETING.

From May 3d to 7th the First Regiment Armory at Broad and Callowhill streets, Philadelphia, will house "The Happy Family," as the National Association of Hosiery and Underwear Manufacturers is known among its friends.

A large attendance is expected and the exhibition will exceed those of previous years. While the program has not been announced as this is written. Secretary Carter may be depended upon to have subjects of vital interest discussed by the most able authorities.

Furthermore every delegate will be expected to wear a smile and will be called upon to explain the reasons therefor if this smile fails to be in evidence at all times. A word to the wise.

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Trade marks and registered names are even more essential in marketing American goods in Latin American countries than they are in the United States. However, great care should be taken that the marks or names under which business is done are duly patented or copyrighted in the republics in which a manufacturer intends doing business before any other step to make connections is undertaken. Benjamin Joachim, who recently resigned as special agent of the U. S. Bureau of Foreign and Domestic Commerce, makes some illuminating comments on this subject from knowledge gathered in his eighteen years business experience in South and Central American countries.

"Latin-American people buy a large percentage of merchandise by name or trademark, and to a larger extent than is done here," says Mr. Joachim. "Of course, as in the United States, there are goods in general use which have no copyright name. As an example, a man in Buenos Aires buying a hat will, figuratively speaking, ask for the 'Lion Hat' or 'Jones Hat.' Perhaps the hat sells for five dollars at the leading shops. Should the manufacturer of either of these hats have overlooked the necessity of trademark register, a rival manufacturer can put an inferior hat selling at considerably less, on the market under the same name. The man who has probably worked years to establish his products thus sees the fruits of his efforts go to a rival. And there is no recourse for infringement, where no registry is made."

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Louis E. Van Norman of New York, has been selected as editor of *The Nation's Business,* the official publication of the Chamber of Commerce of the United States. Mr. Van Norman assumes charge with the April issue. He has had a wide editorial experience. Mr. Van Norman was formerly an editor of the *Literary Digest* and afterwards for a number of years assistant editor of the *Review of Reviews. The Nation's Business* is published monthly in Washington, D. C., and goes to practically every commercial organization in the United States. According to Elliott H. Goodwin, General Secretary of the National Chamber, several important improvements in the method of the publication of the paper are in contemplation.

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Taxes are sometimes extensively used toward defraying the expenses of political campaigns, of representatives, of rivers, of harbors, and of new laws, without which no civilization would be complete.

## SOUTHERN COMMERCIAL CONGRESS.

The sixth annual convention of The Southern Commercial Congress, which as previously advised is to be held at Muskogee, Oklahoma, April 26-30, is to have a most attractive program, a general outline of which is as follows:

OPENING DAY

Address by the Governor of Oklahoma.

Address by the President of the United States.

SECOND DAY

Theme—*Agriculture*—under the sub-divisions of Finance, Production, Distribution, and Organization.

Report of the United States Commission on Agricultural Finance.

Report of the National Marketing Committee.

Round Table discussion by State and Federal Agricultural officials.

THIRD DAY.

Theme—*Immigration*—under the sub-divisions of congested population in industrial centers, return of thousands from Canada, and the policy to meet the conditions at the close of the European war.

Report of the Committee on Immigration appointed at the Conference held in Washington, December 12th.

Round Table discussion by State and Federal Immigration officials.

FOURTH DAY.

Theme—*Municipal Efficiency.*

Report of the American Commission of Municipal Executives to the International Municipal Congress held in London in July, 1914.

Round Table discussion by sectional and national civic organizations.

Session Southern Commercial Secretaries.

Session Woman's Auxiliary.

FIFTH DAY.

Theme—*Foreign Trade.*

Pan-American session participated in by officials of the Pan-American Union and foreign consular and diplomatic representatives.

Report of the Latin American Trade Committee.

Report from the National Foreign Trade Council.

Round Table discussion by representatives of foreign trade organizations.

Following is a partial list of the distinguished speakers on the program:

Hon. Woodrow Wilson, President of the United States. Robert L. Williams, Governor of Oklahoma. George W. Hays, Governor of Arkansas. Robert L. Owen, U. S. Senator from Oklahoma. T. P. Gore, U. S. Senator from Oklahoma. Joseph L. Bristow, U. S. Senator from Kansas. Duncan U. Fletcher, U. S. Senator from Florida. William G. McAdoo, Secretary of the Treasury. William B. Houston, Secretary of Agriculture. Hon. Myron T. Herrick. Ralph Moss, Congressman from Indiana. Hon. John Barrett, Director General, Pan American Union, Washington, D. C. E. E. Pratt, Chief of the United States Bureau of Foreign and Domestic Commerce. T. S. Southgate, First Vice-President, The Southern Commercial Congress. Joseph H. Peyton, President Nashville, Chattanooga & St. Louis Railway. E. L. Daughtridge, Lt. Governor of North Carolina. William Straight, of Morgan and Co., New York. Fred W. Davis, Commissioner of Agriculture, Tex. H. E. William, Commissioner of Agriculture, La. John H. Page, Commissioner of Agriculture, Ark. George W. Koiner, Commissioner of Agriculture, Va. E. J. Watson, Commissioner of Agriculture, S. C. W. A. Graham, Commissioner of Agriculture, N. C. R. B. Elmore, Mngr., Texas Immigration Information Bureau. Justin F. Donochand, Secretary, State Immigration Bureau of Louisiana. W. G. Ashton, Commissioner of Labor, of Okla. Prof. G. L. Swiggett, University of Tennessee. Charles Dillon, Editor, Topeka, Kansas. Col. Robert M. Mixson, Williston, S. C. William H. Saunders, Treas. and Resident Director, The Southern Commercial Congress. J. J. Pastoriza, Finance and Tax Commissioner, Houston, Texas. Dr. Fletcher B. Dresslar, Peabody College, Nashville, Tennessee. Louise G. Lindsley, Pres. Gen., Woman's Auxiliary, The Southern Commercial Congress. George C. Lewis, Vice-Pres., Woman's Auxiliary. A. V. Snell, secretary, Chamber of Commerce, Charleston, S. C. W. C. Culkins, executive secretary, Chamber of Commerce, Cincinnati, Ohio. Charles J. Baer, Secretary, Chamber of Commerce, Little Rock, Ark. Col. Clarence Ousley, Director, Extension Service, Texas A. & M. College. Rabbi Henry Mayer, Kansas City, Mo. Adolph Boldt, Secretary, Chamber of Commerce, Houston, Texas. Philip Manson, New York City. Bradford Knapp, U. S. Department of Agriculture. Dr. J. D. Eggleston, President, Virginia Polytechnic Institute. C. H. Markham, President, Illinois Central Railroad. M. V. Richards, Industrial and Agricultural Commissioner, Southern Railway. Charles J. Brand, Chief, U. S. Office of Markets and Rural Organization. Dr. Andrew M. Soule, President, Georgia State College of Agriculture. Col. Harvie Jordan, Secretary, American Commission on Agricultural Organization. Charles S. Hamlin, Governor, Federal Reserve Board. Bruce Kennedy, Secretary, Business Men's League, Montgomery, Ala. James J. Farrell, President, U. S. Steel Corporation. Robert F. Rose, Foreign Trade Adviser, State Department. George Woodruff, President, Wood-Trust Co., Joliet, Ill. J. Russell Lorzilleri, Rochester, N. Y. Dr. W. M. Riggs, President, Clemson College, South Carolina. Carl Vrooman, assistant secretary, Department of Agriculture. Edwin F. Sweet, assistant secretary, Department of Commerce.

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The Langren Hotel at Asheville, N. C., as the headquarters of the Southern Textile Association in convention on June 25-26, will be the scene of a unique textile exhibit on that occasion. Members and guests will be clothed in cotton, and cotton goods from many southern and northern mills will be seen. For this special occasion all will become "living models." Make your arrangements now.

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There are 3,752 men and women actually employed on the work of the Panama-Pacific International Exposition, either on the grounds or in the down-town office buildings. There are employed on the exhibit palaces, 723; on buildings of the states and nations, 1,026; on concession buildings, 646; building exhibit booths, 138; clearing the grounds, 378; electricians, 112; firemen, 74, guards, 119; sculptors, 40; gardeners, 98, and office employees, 298.

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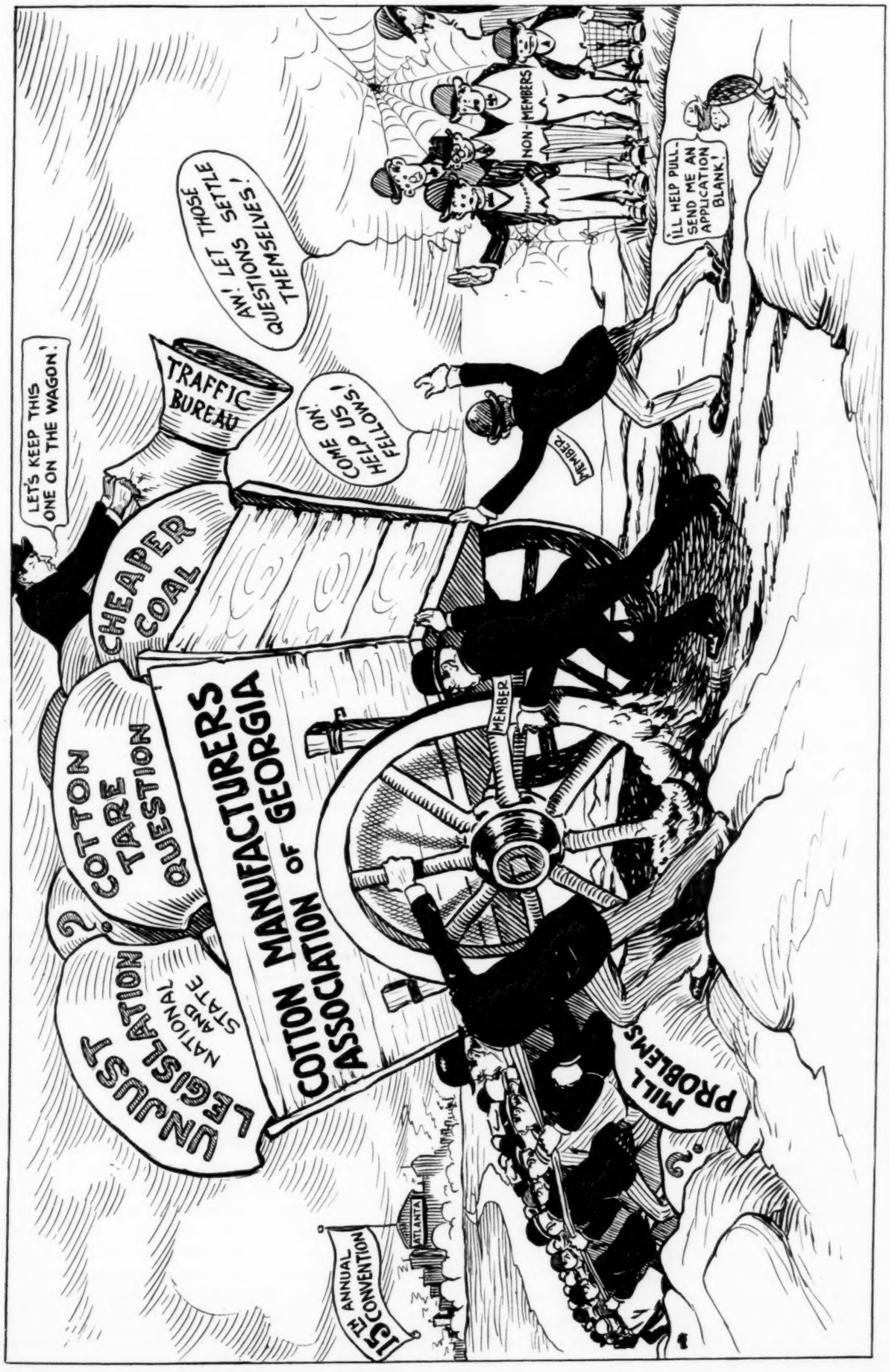
It is stated by a large Argentine flour mill which annually uses a great number of bags for flour that they are not imported any longer in considerable amounts, but that the cloth is imported and the bags made up there. This cloth comes from Calcutta and Dundee, and from the same places also come such bags as are imported ready made. There is no reason, however, why American bags and bag cloth should not be imported if proper efforts are made to push their sale.




Fifteenth Annual Convention Cotton Manufacturers of Georgia, Piedmont Hotel, Atlanta, Tuesday, May Eighteenth.

# The Rural Control of Congress

BY JAMES A. EMERY.

The Librarian of Congress reported a short time ago that in five years ending with the fourth of March, 1914, for that five-year period, there had been enacted by the Federal Congress and state legislators 63,000 new laws. Some fifteen per cent of these were the product of Congress, and during that period, and in relation to the questions which arose out of them, the courts of last resort in our states had expressed their views in 65,000 decisions, of which 13,000 were decisions of the Supreme Court of the United States.

These proposals deal not only with the permanent and abiding necessities of a nation of vast and complex and varied interests, but they represent in each passing year the philosophy of the market place, of the academy, of literature, the popular notions that for the time excite public enthusiasm, the various nostrums, good and bad, which individuals lug into the public arena, sometimes for the benefit of the public, but more frequently for the advancement of their personal interests; they represent the necessities and the experiments of each passing hour, but they leave all their abiding influence upon the nation and as each year passes, more and more permanent tendencies emerge from the rock of ephemeral legislation and show the way toward which law making constantly tends.

We have ceased to be an agricultural people, we are supremely an industrial people. The chief wealth of this nation is in its manufactured products; their value is twice the value of its agricuultural products, and it is these that have brought us chiefly in contact with the nations of the earth, built up that enormous export trade that carries our wares into every community throughout the world, and yet we are governed this hour as though this were an agricultural and not an urban and industrial nation. You may get a thousand explanations of the point of view of those who have engaged in this remarkable business legislation that has attracted so much of our attention for the past two years until men have worried more about new laws than about old debts or new markets, and we have tried thousands of ways to explain this tendency. We talk sneeringly of reformers; we feel exasperated at radical propositions that seem to have no practical fitness. We know here that they originate in the personal ambitions of the would-be leader of his fellowmen, provided that the pathway of leadership leads to the public purse; we find ourselves watching the support of new things by reformers more interested in the reformer than in the reform, but one cannot explain the persistence of antagonistic or hurtful or injurious legislation, the burden of which, while falling heavily upon the industrial and, therefore, urban population of a country, always moves with so much concern and permanent consideration for the agricultural and rural population of the country. Rural claims threatened to stop the adjourning of the last Congress. Millions of dollars are appropriated annually for the continued increase of rural free delivery routes; Government postal banks are established in the most remote agricultural districts. The Congress, like the Israelites of old, "scattereth its wheat in many communities."

Year after year we have increasing amounts appropriated for the destruction of every form of an agricultural pest, from the boll-weevil to the prairie dog, and, as one gentleman suggested in the last Senate, the snapping turtle. But, how much is proposed for the abolition of the evils that infest manufacturers? He is constantly inquired into, investigated, and if you don't ascertain anything that involves him morally but discover he makes a profit, a new plan of taxation is put forth. Why this persistent antagonism? Are you dishonest? Are you engaged in a dishonest calling? Is the business of manufacturing a thing that arouses public suspicion? Is your business in itself a thing that should arouse the antagonism of those who govern you? Are your representatives elected for the purpose of becoming public prosecutors? Do you find in the examination of your own conscience a reason for the creation of governmental distrust? Then, in what does it lie? What permanent, abiding thing lies in the legislative body that increasingly infers not only a public suspicion of the manufacturer and persecutes his methods of combinations for the forming of business, but makes his very success the bane of the manufacturer?

What is the state of mind of the men who make the laws, and who makes them? Are they made by people who understand industry, who are familiar with manufacturing, who are living in manufacturing and industrial communities, who are in touch with the great throbs and expanding and moving of industry, who has a sympathetic ear for the man who struggles for his monthly payroll?

An examination of the existing Congress demonstrates beyond the possibility of cavil that not only its outlook and its inlook, its experience, its environment, the ideals of the case, as Bacon called them, all those circumstances that by birth and early education and sympathy go to make up the attitude of a man, its controlling factor finds no business representation. It not only has not business men, but it does not represent business men. The outlook, the sympathy, the environment of those in the saddle at this hour and who have made the legislation that has attracted so much attention, created so much concern, aroused so much fear, is the outlook of an agricultural and rural representative, without understanding or sympathy with urban or industrial population, and whose knowledge and contact of any consequence in politics, never came from organized industrial life.

There are 435 members in the present Congress: 290, the majority part, are Democrats. If we take our nation we find it divided by the census authorities into three practical groups, the Northern, Southern and Western States. The Northern States have a population, in the 1910 census, of approximately 56,000,000, that is estimated today at substantially 71,000,000. Of that population, 10,000,000 more are urban than are agricultural. Such has been the swing of population toward industries, or toward the city where industry conquers. The sixteen Southern States,

Extracts from an address before the Manufacturers' Association of Newark, N. J.

which represent practically the group of so-called Southern States of the Civil War, have a population of twenty-nine and a half millions, roughly speaking. Of that population twenty-three and a half millions are agricultural or rural and approximately six millions live in cities of three thousand or over. In the Western States of eleven we have seven millions of population, with a majority living in the city of three millions. The Northern States have in the legislature which may be spoken of as our Government, 154 members of Congress, the Southern 125, the Western 11, and since the Western and the Northern are not intensely interested in agricultural courses, you will see these have 165 members, and the governing body, as against 125 in the Southern States. But the control of legislation is not a matter of merely legislators. Irrespective of the issues, our Southern Congressmen are returned. They come like the members of the English Parliament, year after year, from their communities, and these 125, by virtue of their seniority of service, have achieved the chairmanship and most of the places upon all the great committees that really make legislation. The legislation of our Congress is made in committees, not on the floor, and these committees alone say what the House shall consider and when it shall consider it, and under what conditions, and it is around the committee table that all the great pieces of legislation are formulated, except when that legislation proceeds from some higher source and the legislative body merely becomes the stenographic executive of some other source. In the House, of the fifty-eight great committees, fifty-five are controlled and their chairmen are from the 125 men who come from the South. Only three committees, those on Appropriations, Mines and Pensions, have as their chairmen Northern men. In the Senate all but six committees are subject to the same control. Four Southern men are found in the cabinet. Mr. Bryan is one of the most notable rural sympathizers. The President himself is Southern by birth, and his traditions, sympathies, his public expressions, are notably rural, and if not anti-industrial or urban, at least non-industrial and urban.

Note that 125 representatives, representing twenty-three and a half millions of rural population, as against six millions of urban or industrial population, are in control of the machinery which makes the legislation of the republic. There are 165 Northern members. The 125, by virtue of their strategic position, make or unmake the legislation coming from committee. One hundred and forty-five represents a majority in any caucus of the party; seventy-four is a majority of that quorum, and the action of seventy-four can, at any time, bind the judgment and conscience of 216 who remain at home, and I was quite overcome by the knowledge that quorums of the legislators were rarely present and much business was transacted without quorums. Now, at this time 125 men dominate the making of the legislation so important to the industrial and urban life of the nation, representing twenty-three and a half millions of agricultural people as against six millions of urban population. Forty-nine per cent of the American people are living in cities of 3,000 and 40 per cent in cities of 8,000, 89 per cent of the people for whom they legislate are living in industrial communities. New York has more population comprehended within its limits than all the urban population which these 125 men represent. Chicago has a larger population than any Southern State with the sole exception of Texas, and it is the city population or industrial population which pays three-quarters of the excise tax, the income tax, the corporation tax, and the internal revenue tax.

Twelve industrial states, it should be remembered, Massachusetts, New York, New Jersey, Pennsylvania, Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Missouri and California, elect 230 of the 435 congressional representatives, and these twelve states have 50 per cent of the population, three-fifths of the voters five-sixths of the wage earners engaged in manufacturing; they produce fifteen of the twenty billion dollars worth of manufactured products; they have 50 per cent of all farm value; they pay $282,000,000 out of the $380,000,000 internal revenue; $33,000,000 out of $43,000,000 corporation tax; $24,000,000 out of $28,000,000 of income tax; they have four billion of the five billion dollars that are found in the savings banks of this country, and they represent in their population two hundred and fifty billion dollars invested in the industries and business of the nation.

We should not for a moment criticize the representation of the farmer in the legislature, but we should insist that in a nation with an industrial interest, industry must be adequately, intelligently and fully represented if an industrial nation is to live and succeed. Laws made by its representatives must be made with information, with knowledge either in the possession of him who makes the law or absorbed from those familiar with their subject.

The political influence of organized labor coming in contact with a situation of that kind, the manufacturer and employer being himself under political suspicion, you have as a natural result an intimate, personal and influential relationship between a dominant legislative interest representing rural communities and the only form of industrial life with which it has experience and intimate contact—organized labor.

The remedy is in the hands of the industrial element of the community. You cannot afford to continue to be indifferent in the making of regulations for the conduct of your business. We would not think of electing a board of directors who had no sympathy or understanding of our proposition, and yet, here in the most gigantic corporation in the world, we, the stockholders, are sitting quietly by while the minority interest, unsympathetic with all, out of touch, unfamiliar with the great dominant interests in the corporation, continues to operate its business.

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Two new cotton mills in Bombay, the erection of which began in 1912, are now completed. One of the new mills, the Simplex, which will be under the management of D. M. Wadia & Sons, has been fitted up with electrical machinery which embodies all the latest improvements. It starts with 20,000 spindles and 800 looms. The other mill, just ready, which will also be worked electrically, is the Pearl mill, the agents of which are Sir Curinbhoy Ebrahim & Sons. At present the mill has 20,000 spindles and 180 looms, which will be increased later on.

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An American consul in Europe reports that a firm desires to purchase American cotton-mill products. The consul states it is a well-established and highly recommended firm. If interested apply to the Bureau of Foreign and Domestic Commerce and refer to file No. 14668.

## THE INDIVIDUAL MOTOR DRIVE.

BY J. E. BULLARD.*

In the early days of the application of electricity generated by water power a large motor was occasionally installed on the engine bed or near it and used to drive the line shafting which had been originally installed for steam engine drive. Although the original investment is smallest where such an installation is made, a thorough investigation shows that it is most expensive to operate. Even with very cheap power it is usually extravagant to install a motor in such a manner.

The next step was to install a motor for each two floors of the factory. A motor was belted to line shafting used to drive the machinery on both the floor above and the floor below the shafting. Installations have also been made where a motor is belted to shafting suspended from the ceiling and driving the machines on the floor above by means of belts running through holes in the flooring.

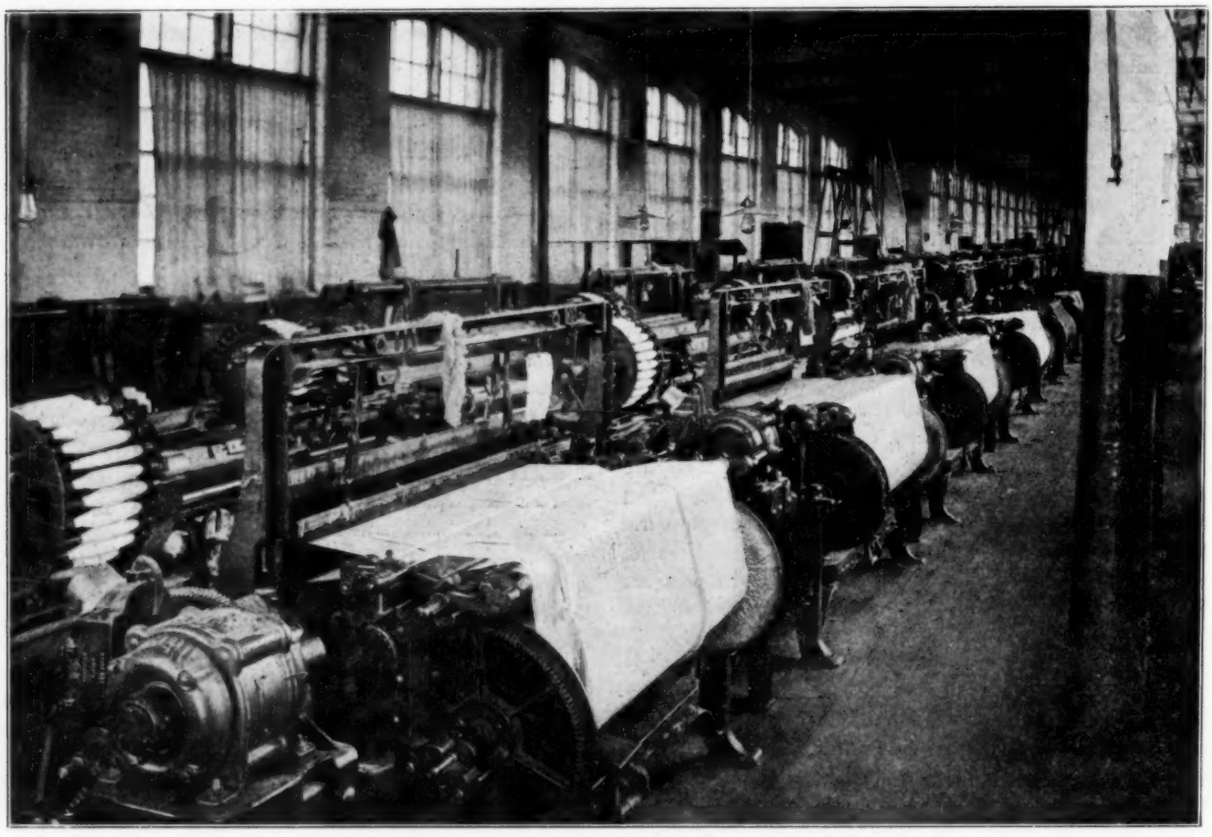
The final step is the installation of a motor on each machine. This appears to be the tendency at the present time and is supported by the three arguments, increased production, decreased power cost, and decreased fire hazard.

### INCREASED PRODUCTION.

The following analysis has been made of the average cost of manufacturing in various industries. These figures, at the time of their compilation, were supposed to represent actual average costs for a large number of industries. Whether they are accurate or not they will serve the purpose for which we will use them. The cost of manufacturing was divided into the four groups—power, labor, raw material and fixed charges, office and selling expenses. The figures obtained were power, 5 per cent; labor, 35 per cent; raw material, 30 per cent; fixed charges, office and selling expenses, 30 per cent. Examination shows that the only variable charges are power, labor and raw material, and that power may have a direct bearing on the other two. Let us take a concrete example.

Suppose it costs a dollar to turn out one unit of a particular grade of our product and that the above analysis holds true in regard to the different costs. We, then, spend per unit, 5 cents for power, 35 cents for labor, 30 cents for raw material, and 30 cents for fixed charges, office and selling expenses. If we turn out 100 units per day, the various costs are as follows: Power, $5.00; labor, $25.00; raw material, $30.00; fixed and selling expenses, $30.00. A total of $100.00. Now suppose that we find a power, which, due to its uniformity results in an increase in production of 10 per cent. This power costs $1.00 per day more than the old power and results in the following costs. Power, $6.00; labor, $35.00; raw material, $33.00; fixed charges, office and selling expenses, $30.00. A total of $104.00 per day. Since, however, we have turned out 110 units instead of the standard 100 units we find our total cost per unit is reduced nearly 6 cents, that it is 104 divided by 110 or a trifle over 94 cents.

If we try to reduce our power cost and succeed in finding a form that costs only $4.00 per day but which is of such poor quality that we can turn out only 90 units per day or 10 per cent less than normal we discover these facts. Power costs, $4.00; labor costs, $35.00; raw material costs, $27.00.



MOTORS GEARED TO LOOMS AT THE RIVERSIDE AND DAN RIVER COTTON MILLS, DANVILLE, VA.

*The Society for Electrical Development.

A total daily cost of $96.00. We have turned out only 90 units so that our unit cost is 96 divided by 90 or $1.06. A saving of $4.00 per day has increased the cost per unit by 6 cents.

All labor may be paid on a piece work basis so that the thought occurs that this would not apply to the cast in point. Let us find out. On piece work the cost per unit would be 35 cents, when we increase the quality of our power we then have: Power, $6.00; labor, 110 times 35 cents, or $38.50; raw material, $33.00; fixed charges, office and selling expenses, $30.00. A total of $107.50, making a unit cost of 98 cents. On piece work we have saved 2 cents per unit.

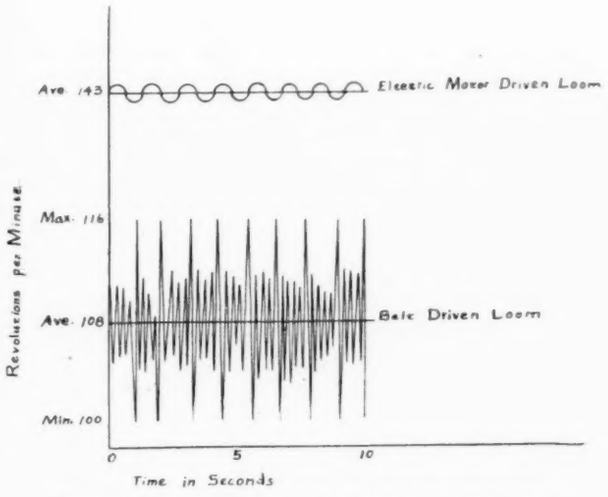
Let us try the poor power. We now find: Power, $4.00; labor, 90 times 35 cents, or $31.50; raw material, $27.00; fixed charges, office and selling expenses, $30.00. Total, $92.50. Cost per unit, $1.03. On a piece work basis the cheaper and poorer power has increased the cost per unit 3 cents.

The values used *are not vouched for as actual values* existing in the cotton industry. They are simply *average values compiled for the purpose of illustration* and may, or may not, be accurate. The principle illustrated, however, can be applied with profit to any business, the actual costs existing in the business before and after changing the form of power being used.

A company selling specialties, paying its salesmen on a commission basis and giving them nothing free except selling training, found it so profitable to increase the sales of each man through careful sales training that it retained the services of a high priced man and kept an expensive department, whose sole duty it was to increase each man's sales. In operation, it found that the fixed charges, chargeable to each salesman were large enough to warrant this expense. The fixed charges of each salesman, however, were not nearly as great as the fixed charges, chargeable to each employee in the cotton mill. Nevertheless, the above mentioned firm found its system so profitable that it has been able to buy up or force out of business nearly all its competitors and now has almost complete control of the field.

The maximum output of each machine is dependent on its being run at a certain maximum speed. Practically all the machines used in the textile business are constant speed machines. In order to run these machines at their maximum speed a very steady power must be used. Speed tests with recording tachometers, instruments which give a graphical record of all speed variations, and momentary tests made with portable tachometers, show there is a greater speed variation in belt driven machines than in direct electric motor driven machines. The accompanying curves, which were plotted from tachometer readings taken on two different looms in a textile mill, show how much greater this variation actually is. As the curves show, the speed of the direct connected motor driven loom is very constant. The actual speed variation proved to be only 1 per cent. The speed variation of the belt driven loom on the other hand was 14.8 per cent or 13.8 per cent greater than the electrically driven loom. It is self evident from this test that we may expect a considerable increase in production for the same fixed charges if we adopt direct connected motor drive. There may be cases where the value of this increase in output might equal or even exceed the cost of power.

The greater initial investment has deterred many a mill owner from installing the individual motor drive. He feels that the greater cost is not warranted by the advantages to be gained. Of course local conditions have their influence and no universal rule can be laid down. There may be cases, however, where the saving in power alone without regard to the increase in production would warrant the additional first cost. Actual tests have shown a power consumption, depending on the size and speed of the shafting, of from .027 to .191 horsepower per bearing. It is easy to see how rapidly the power required to drive long lengths of shafting counts up. It is not at all extraordinary to find cases where half of all the power developed is required to drive the shafting and belting with all the machines idle. A considerable amount of this power lost can be saved by




Curves Plotted From Tachometer Readings.

the adoption of direct motor drive. This power saving will be most marked during slack periods when only a comparatively few of the machines are in operation.

A very important feature in cotton mill construction is the fire hazard. In the past the problem of transmitting power throughout the factory and keeping this hazard as low as possible has been a very serious one. All methods of mechanical drive have been employed but none have proven as effective as the individual motor drive. Where motors are geared to the driving shaft of the machine as shown in the illustration, there will be no bearings in inaccessible places which might gather lint, run dry and heat up, and there will be no holes in the floor which fire underwriters may rule against. There will be no vertical compartments for vertical driving shafts which in case of fire might aid in carrying the flames from floor to floor. In this system all bearings are readily accessible, the power control is conveniently located, the speed is as nearly constant as possible and the space above the machinery is entirely free from all obstructions such as moving belts and shafting which might throw oil and dirt on the material being manufactured, and on the walls and floors, making the room untidy and tending to increase the carelessness of the operatives.

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Taxes are levied on the amount of furniture and other useless material in your house, which you are paying for upon the installment plan, unless you happen to be so wealthy that the tax assessor does not keep you worrying.

## TAKING A "TIME STUDY."

BY A. M. OLIVER.

During my first days of work on scientific management I was taught a very important lesson by Mr. H. L. Gantt who was in charge of the work. It happened that he set me to work taking observations and time studies on a set of water-mangles in a bleachery to determine the best method of setting a bonus task. After some days he paid me a visit and inquired how things were going. I informed him that I thought I had taken about enough study on the job and that I was going to make a "write-up" covering the task. This I did and to my sorrow found that not one of the men accomplished the task I had set. They continued to try for days and days and continued to fail in their effort to succeed. I became rather worried, principally for two reasons; first I thought that all I had to do was to tell the men what was required in the line of production and when they failed to do it I began to think there was something wrong with my figures; second, I was anticipating the "call" I was going to get when Mr. Gantt arrived and found I was still on the job and the men were still working the old way. While I was pondering over my troubles and how I should answer the questions Mr. Gantt would ask, he came through the door. I told him how I had taken the studies and how I had set the task. I also told him that no one had accomplished the task. He looked at me with a look that I believe is only characteristic of himself and before he had time to speak I jumped out of the fire into the furnace. I told him that the task could be done and I would prove it by doing it myself. With that same fiery look he said, "My boy, it isn't a question of what you can do. The question is, can you teach these men how to do it? Can you show them how to accomplish the task you have set? Can you prove to them that they waste much time that could readily be turned into money for themselves? If you cannot teach the men the right way your efforts are wasted."

This was a great lesson for me. I found that a stop-watch, a pencil and a time study sheet didn't show a man how to improve his time to a greater advantage than he had ever done before. I found that to get the best results I must tell the operatives just what I was going to do; just why I was going to take a time study; that I must show them just why it would be an advantage to them to work on bonus. In many cases I found that operatives became curious about a stop-watch and in such events I have often shown my watch to those who were more or less worried.

I had to admit to Mr. Gantt that I had not gone at my work in the way suggested and it was agreed that I would immediately change my method. I went to the men and explained the situation to them. I told them it meant money for them. I showed them how they were wasting valuable time and how they could increase their production if they would plan to keep their machines running every minute possible. Within seven days every man in the department had made bonus. They were a contented lot of men. More than that they were enthusiastic about their work.

Sometime after that I had occasion to be taking a time study in a tenter room. I had learned my lesson I thought, but fate was right behind me. The trucker had just placed a roll on a truck and for some reason had gone down the room. I immediately took hold of the truck and proceeded to push it to the elevator. I hadn't gone far before a hand lighted softly on my shoulder. "We can get all the men we need to push trucks and we only have to pay them 14 cents an hour," said Mr. Gantt. "We hired you to teach people a more efficient method of working and not to improve on pushing trucks." This was my second lesson within a month. I had nothing to say. It was true I was not hired to push trucks. It was also true that truckers were to be had for 14 cents an hour. I had no argument.

I learned that to get the best results I had to first get the consent of the operative before taking a time study. I found that I was obliged to answer a rapid-fire of questions that the operative would ask, and I found that I must exercise the greatest diplomacy in answering. If I were to tell an operative that I was going to increase his wages and if I increased his output and not his wages, he immediately lost confidence in me. Within a few hours all the operatives would be aware that I had misrepresented something. If I failed to get the good will of the operative, I had a mighty hard row to hoe especially on hand operations where the possibility for false motions is so great as compared with machine work.

I found that it paid to be honest with the operative. I found that it didn't pay to be sarcastic or to lend the idea that I knew it all and the operative knew nothing. I found that I must be the equal of the man or woman with whom I was working. If he or she was an overseer I was his or her equal. If a beam carrier I was only equal to that operative while on the job. It doesn't pay an efficiency engineer to say "I don't believe you are doing that the best way." But rather ask the operative if he doesn't think that it could be done easier and quicker your way. If he disagrees ask him to give it a trial. The result of the trial will prove whether his or your way is the better.

Harrington Emerson says there is but one easiest way.

It is wrong to believe you are fooling an operative when you are taking a time study. When you think you are fooling the operative you are in reality fooling yourself. Above all don't go around with a stop-watch in your pocket taking time studies. This I believe is the most sneaky, low, unmanly trick I know of. You are at once branded by the help as a spotter, sneak, snake and other names too numerous to mention. The help fears your appearance in the room. They feel that you are there to do them some harm. Why shouldn't they? Wouldn't you fear some harm if a man walked around your home all night with a revolver in his hand? The help, under these conditions, weld themselves together with the express purpose of hindering the efficiency work. I realize that the presence of a stop-watch is a subject of much criticism and I also appreciate the fact that a vigorous campaign is under way to prohibit the development of present day industrial management in government shops. Bill HR-8662 is entitled: "To prevent the use of a stop-watch or other time-measuring device on government work, and the payment of premium or bonus to government employees, and for other purposes." Section 4 of the bill reads: That any person violating any of the provisions of this act shall be guilty of a misdemeanor, shall be punished by a fine of not more than $500, or by imprisonment of not more than six months, or by both such fine and imprisonment.

However, the following statement was issued from Washington on November 12, 1914:

"While admitting that scientific management of government arsenal work is not liked by many labor organizations and that bills intended to stop it have been favorably reported by some congressional committees, General William Crozier, chief of ordnance of the army in his annual report submitted today declared that with the extension of the system now proceeding, its advantages have continued, and increased. At the Watertown Arsenal he shows that some classes of employees received 29.27 per cent of their wages as additional bonuses.

"Gen. Crozier scouts the idea that scientific management involves the undesirable hurrying of men to their resultant physical, mental and moral detriment. He states that the subject has now been taken up by the commission on industrial relations and adds that it seems strongly desired that congress shall not take action until it has received the commission's report."

Most people offer no objection to calipers, micrometer or speed indicator. If they offer no objection to these measuring devices why the objection to a stop-watch? A stop-watch is nothing more than a measuring device and is the best measuring device for measuring time.

## SOME ADVICE FOR YOUNG MEN.

George F. Hoffman, of the Hoffman Corr Mfg. Co., Philadelphia, recently presented an autographed portrait of Judge James T. Malone, of the court of sessions, New Yark, to Grade 8 of the Pleasant street school at Fitchburg, Mass., as a memorial of the days, when as schoolmates they attended this school. Attorney Peter F. Ward of Fitchburg made the presentation address and read a letter from Mr. Hoffman at the conclusion of his remarks that, while directed at schoolboys, contained so much good advice that we are reproducing some extracts herewith:

"There are no sure rules for success. Everyone has different experiences, but there are some sure rules for failure. Here are some of them:

"Be a grouch.

"Be sour.

"Be jealous.

"Be envious.

"Be saucy and impudent at home.

"Watch the clock so you will not work over-time.

"Be afraid you will do something for which you are not hired.

"Talk one way and act another.

"Feel that your time is your own after hours and you can use that time for dissipation so you will be unfit for work the next day.

"Put things off until tomorrow.

"Spend more than you can earn.

"Sacrifice your best friend for a nickel and call it business.

"Be a gossip and spread around all the discontent you can. Begin at home so you can do a good job outside.

"Feel that everybody is sitting on your chest and you have no chance.

"Do not see any good in anybody but yourself.

"You will find that the bigger the man the plainer he is is his ways.

"Don't gauge a man from the dollar standard. I know some men who are millionaires several times and it is time wasted to be in their company; I know men who are in no way mercenary and it is a mental treat to be in their company. Any man or woman is a success who has a contented mind and distributes sunshine.

"Rev. Dr. Russell H. Conwell is a successful man. He has delivered his one lectnre 'Acres of diamonds' 5,000 times and if the money he had earned from that lecture had been put on interest today it would amount to over eight million dollars, but he has given every penny of it away to try and elevate humanity. Temple college which he established has had nearly a hundred thousand students—a boy or girl can attend there day or night and be awarded a degree. His 5000th lecture was given at the Academy of Music in Philadelphia and it was a gala night for Philadelphia. A military and students' parade was one of the features of the celebration. Hon. John Wanamaker appointed me chairman of the military committee. The Union league was decorated with flags—the first time that this distinction was ever shown to a civilian.

"The next day Dr. Conwell came to me and thanked me for my small part in the affair and he said 'If you feel that I can ever do you a favor, ask me. I told him that he had done me a favor 30 years ago—he seemed surprised and asked what it was. I told him that one Sunday evening I had stopped in his church and he said in his talk 'A young man needs hindrances and not help to bring him out.' I told him that I had the hindrances all right but his remarks made me look at life from a different angle.

"Now, when you go out into the world do not get cold feet if everyone you meet does not hand you a rose, and remember 'Nothing worth while comes without effort.' So do not be afraid to apply yourself. At the same time, do not go around with a long face; be merry and laugh. The Lord loves funny things, if he did not he would not have made the poll-parrot and the monkey. Do not feel that the world owes you a living; the world owes you nothing, you owe it all to the world and remember there is nothing that pays so big a dividend as being polite."

## THE HEALTH OF THE EMPLOYEE *

BY WILLIAM HALL COON, M. D.

Were any employer of labor to be asked which he would prefer to employ, a well man or a sick man he would undoubtedly consider that he had been asked a nonsensical question and, if he replied at all, would probably state that he would not employ a sick person if he were aware of that person's illness.

Were the same employer asked, however, "How many of your employees are in good health and able to give you their best work?", an answer might not so readily be forthcoming although in either instance the query would be much the same in intent and purpose if not in actual wording.

Still another question might be asked. Is it advisable for you as a manufacturer to maintain a system of medical supervision over the health of your employees, and should you by chance succeed in employing only those persons in good health is it for your best interests to take measures to insure if possible the continuation of this state of good health during employment?

This last question I have asked of several employers

*Extracts from a paper read before the National Association of Cotton Manufacturers

in your industry and I have received several different sorts of replies. Some have stated that they believed that this work might be taken up with material benefit to themselves and their employees. Some have flatly said, "No, it cannot be done." Others have said substantially this. "When we have provided well-lighted, sanitary factories for our employees and have paid them the best wage consistent with the industry, we feel that our responsibility ceases and that any other work directed toward the betterment of the health or other conditions of the employee should have its place without the mill and should not concern the mill management. Such a statement as the last quoted has been made to me by men for whose judgment and sagacity I have such respect that I would hesitate to set forth my personal opinion against theirs were it not that from my own experience I have become convinced that the medical supervision of employees is advisable and that it can be made an economical procedure, of advantage not only to the employer but to the employee as well.

I feel that it is almost unnecessary for me to do more than mention in passing the good that is to be had through an observance of the principles of factory sanitation, for to a manufacturer who fails to recognize and follow out these principles any appeal directed toward the betterment of the health of employees must be made in vain. It is highly probable that today the greater number of manufacturers recognize the advantages that come through the maintenance of clean, well-lighted, sanitary factories in which the comfort of the employee is carefully looked after. People work better under conditions of good light and cleanliness and it has been found that more and better goods are produced in factories where such conditions obtain than in similar establishments where work is carried on under lower standards of sanitation. So well are these facts recognized that modern factories are designed so as to utilize to the best possible advantage all available lighting areas, and to provide for every modern appliance of mill sanitation. All this, however, is not done because of sentiment but for the very good reason that it pays, and pays well. It would also pay to people these factories with employees in good health capable of giving their best efforts through each working hour of the day.

The delay in the recognition of ill-health and the causes of such ill-health among working people is due to several such reasons. Among these are:

*a*, The lack of sufficient appreciation on the part of business men of the health of employees as a factor in industrial efficiency.

*b*. The absence of a systematic supervision of the health of employees while at work.

*c*. A lack of knowledge on the part of employees concerning the maintenance of their health, and the prevention of disease.

The efficiency of any machine rests upon the efficiency of the person operating it. You can speed a machine to its limit, but the material passing through will suffer if the person in charge is careless or inattentive, and time will be lost even though the imperfections in material may later be removed or repaired. This carelessness or inattention of the employee may be due to causes over which you can have no control and which no amount of work on your part could remove or anticipate. On the other hand, this carelessness or apparent inattention may be due to causes which you can remedy.

In the ten years, 1900-1909, about 64,000 persons died from tuberculosis in Massachusetts, and at the present time tuberculosis in all its forms causes one-ninth of all the deaths in the state. The disease prevails among young adults and seems to associate itself with those who have failed to recognize and adopt the better standards of living.

Tuberculosis however by no means represents the only cause of ill health in employees. Other organic diseases and physical defects are present in the mill employee as well as in the mass of people at large and correspondingly affects his capacity for work. Physical defects increase materially the hazards involved in any occupation. An epileptic in one of his seizures is liable to fall into moving machinery; an employee with a hernia may aggravate this affliction through strains in lifting. The employee with disease of the heart is susceptible to heat, exposure or sudden exertion. Employees suffering from varicose veins may develop varicose ulcers or infections through slight abrasions, and a deaf employee is particularly liable to accident. Defects in eyesight or partial blindness may become total blindness from an accident to the good eye.

Another cause for the examination of employees lies in the situation now arising out of the Workmen's Compensation Laws. These laws have considerably increased the value of physical examinations because of the removal of the employee's responsibility for the accident, and the inclusion under the law of diseases both of an occupational type and of acute types that may develop from physical exposure during employment. In Massachusetts the Industrial Accident Board has defined as a "personal injury," "Any injury or damage or harm or disease which arises out and in the course of the employment which causes incapacity for work and takes from the employee his ability to earn wages."

This defination of "personal injury" has been upheld in a decision sent down by the Supreme Judicial Court in the case of Johnson vs. London Guarantee and Accident Company, Ltd. In this instance an employee, seventy-two years of age, a paint grinder by occupation, became unable to withstand the influence of the poison due to lead constantly introduced into his system, the result leading to his inability to work. Here it was held by the court "Under the act 'personal injury' is not limited to injuries caused by external violence, physical force, or as the result of accident in the sense in which that word is commonly used and understood but under the statute is to be given a much broader and more liberal meaning."

This decision is wide reaching in its importance, for although in this instance the injury arose from the effects of a mineral poison, it was nevertheless the result of the employee's occupation on his bodily health.

Similar opinions have been handed down by the Industrial Accident Board of Massachusetts, some of which have been appealed to the Supreme Judicial Court, while others have been uncontested.

In the case of Black vs. Travelers' Insurance Company adjudicated by a committee of arbitration, an employee in a furniture factory received an injury to his ankle which arose out of and in the course of his employment. Some time later he became incapacitated for work, and three months from the time of his injury died of tubercular meningitis. It was held that the injury was a predisposing cause of the disease, and the widow was allowed com

pensation for a period of three hundred weeks at a rate of $8.25 per week.

Two facts showing the importance of the medical examination of employees appear in this case. In the testimony before the committee it was shown that some two years before the date of the injury, the man had suffered from a condition generally associated with tuberculosis. It was also shown that the injury, a fracture at the ankle, was neglected by the patient as he appeared not to recognize its nature, and that for two weeks after the injury he continued at his work until compelled to quit because of pain.

For an injury to the ankle received by a young woman while at work in a cotton mill, and which resulted in a tubercular affection, compensation for total incapacity for work has been awarded in a recent case settled by an arbitration board. This case was not further contested after the award was made.

In the case of Herrick vs. Employers' Liability Assurance Corporation, Ltd., compensation was awarded because of the death of an employee from strangulated hernia following an injury arising out of and in the course of employment. In this case it appears that the employee, a heavy man, had a fall on December 18, and on January 25, had another fall. On January 26, the employee was treated for acute indigestion, and remained home for a week or ten days and then returned to his employment and worked for two weeks or more, calling a physician on February 14, who afterward found a hernia on March 3 or 4. In this instance had a system of medical examination been in force in the factory in which the man was hurt, the injury which afterward resulted in his death might have been discovered and suitable treatment given.

In the case of Hurle vs. American Mutual Liability Insurance Company, compensation to the amount of $3,952 was awarded because of total incapacity for work caused by loss of vision. In this instance the employee's loss of vision was attributed to certain noxious gases which caused degenerative changes in the optic nerve. Here again it would seem, an efficient system of medical inspection and examination would have anticipated the loss of sight.

In each of the cases quoted one question comes to mind, —What was the physical condition of the employee before he became ill or was injured?

Because of the interpretation which has been placed upon the meaning of "personal injury" if for no other reason, it would seem not only practicable but necessary that an employer should know the state of health of each of his employees. An initial physical examination at the time of employment or periodic examinations during employment would undoubtedly serve to prevent certain diseases and various types of accidents by affording the employer the warning of the employee's weakness. This procedure would undoubtedly minimize accident hazards, and where there existed a latent diseased condition would prevent the condition from becoming acute.

The value of examinations as a means of detecting physical conditions in employees that render them unusually susceptible to disease or industrial injuries, has been recognized in a general way for some years. In certain lines of employment such as steam railways a complete physical examination of all new employees responsible for train operation is now standard practice and this practice is gradually extending into other industries. Many large establishments which have as yet not taken up actual examinations of employees have provided for their first care in accident through hospital rooms or dispensaries in the factories while other establishments have employed nurses in order to maintain a better standard of health among their female employees. Other large establishments have taken up the physical examination of applicants for employment and have provided for the periodical examination of employees during service. In one establishment in Chicago, in which some 8,000 persons are employed, and in which for some time a careful system of medical supervision has been carried out, the standard of health and resultant efficiency has been markedly increased.

In a recent conversation with the management of a corporation employing in this country some 65,000 people, I was informed that although the company already provided for the first aid treatment of injured employees, it contemplated going still further and was about to carry into effect a system of medical examination of employees for the reason that they felt such a procedure to be both practical and necessary.

If any member or group of members of your association should consider it practicable to establish a system of medical supervision the following results might be reasonably looked for:

*a.* The health of the working force of the factory would be protected by the elimination of sources of infection.

*b.* The physical deterioration of employees would be prevented by the early detection of disease and the immediate institution of measures directed toward treatment.

*c.* Unnecessary financial loss to the employer should be prevented through the recognition of any slow growing reduction of the working power of employees through disease.

*d.* Personal injuries should be prevented through a knowledge of an employee's weakness to any hazard.

*e.* A higher standard of the entire working force might be achieved through a system of individual and general instruction having as its object the increase of the resisting power of employees below grade and the preservation of health of those below normal condition.

The establishment of a system of medical examination and supervision in your factories presents no difficulties not easily overcome. Any such plan, however, should be carefully worked out with reference to the needs of each establishment or groups of establishments, for several small factories in a community might combine in the work to good advantage. Too much should not be attempted at first, the change has been slow in coming and time should be taken to work out details carefully under the direction of a competent person. The work should result not only in a betterment of the health of the employee but also in a better understanding between the employee and his employer. The work should also pay in dollars and cents because an establishment in which the standard of health is high should command a better insurance rate than one in which the standard is poor or indifferent. I have had it stated to me by an official of one of the largest liability insurance companies doing business in Massachusetts that there should be no expense connected with a well thought out and carefully conducted system of medical examination in any factory, because such a system would undoubtedly pay for itself in the reduced cost of insurance given to such an establishment.

# Mill Conditions and Market Reviews.

## SOUTHERN MILL SITUATION.

In the textile field generally there is a better feeling, in spite of the conflict abroad, and there is reason to maintain moderately hopeful views. Spring is at hand, and with it comes resumption of construction work and general activity. Spring is always a season of hopefulness, but in view of the present uncertainty as to the outcome of the war, the disposition is to maintain a conservative policy in all business transactions. An early termination of the war would undoubtedly be a powerful stimulus for business recovery in the United States, but at present business is being conducted on restricted lines. In the cotton goods industry, orders are being placed with much caution, and on a strictly moderate scale, though the outlook is brighter than a month ago. Cotton mill men state, however, that the orders they get are spasmodic, and there is a disposition to hold back and await further developments. They say, however, that the comparatively small volume of business is partially due to lack of confidence and a universal conservatism, as it is a fact that during the past few months the spirit of economy has almost everywhere supplanted the spirit of extravagance.

Throughout agricultural regions there is little cause for complaint, with the cotton belt as an exception. Naturally this section has felt the reduction of foreign demand, as well as the lower prices which growers were forced to accept, but at that conditions are much better than expected. What the next season will bring to the South is an interesting problem. In a recent issue of the New York Commercial we note they say, apropos of the cotton situation in the South:

"There are those who are predicting now that with the exception of wheat, cotton is likely to profit more with developments growing out of the war than any other commodity. It has only been a little while since the calamity of the war, so far as this country is concerned, was deemed to be its effect on the chief industry of the South—cotton growing. In the early part of December last, cotton was going begging at six cents a pound. With deep emotion from the passionate South, 'Buy-a-bale-of-cotton' resounded through the land. Since then cotton has advanced 200 points, and there are forecasts that it will show a wider margin above the cost of production. Claims that there will be a growing and extraordinary demand for cotton is based on calculations of the heavy consumption of clothing by the armies of the warring nations—that to a larger extent, cotton will be called upon to take the place of wool, owing to the inadequacy of the world's supply of wool to meet the needs of the soldiers in the field. There are now 10,000,000 men on the firing line, it has been estimated. Soldiers at the front wear out a uniform in a month. On that basis a statistician has figured out that the men in the European army will wear out more clothes in one fighting year than they would in times of peace in sixty years. It would take 400,000,000 more sheep than there are in the world to meet such a demand, it is estimated."

The cotton advocates assert there is only one substitute—cotton.

Now that Congress has adjourned, business men will have relief from the harass of hostile legislation. Fortunately, there has been a decided abatement of the opposition to large industrial corporations, which, when other conditions permit, will materially aid business recovery. It is quite a relief to have the nagging of the cotton mill men by the labor agitators come to an end. The nagging was begun early in the session, with the assistance of the National Child Labor Committee, and though the sentiment of the lawmakers was in plain manifestation satisfied with present conditions between the mill owners and their help, the agitation was kept up intermittently until the Senate gave a final and conclusive vote.

The Hard Yarn Spinners Association held a meeting at Charlotte on March 11th, which was fairly well attended. "Speculation must be eliminated in the textile industry, certainly in so far as it effects the hard yarn spinners of the South," was the sentiment expressed at the meeting. The members present were urged to take steps whereby some sort of effective cooperation might be initiated looking to the gathering of information of value to the members and its dissemination. Two forceful addresses were delivered, one by W. S. Lee, vice-president of the Southern Power Company, and the other by W. J. Roddy of Rock Hill, S. C. Mr. Lee urged cooperation, while Mr. Roddey emphasized the importance of the application of sound economic principles to the textile industry, and particularly the need of eliminating speculation from the business. "If you want to speculate," said he, "then seek some other channel and not undertake to gamble with cotton mill properties." The textile industry should be standardized and regulated by sound economic principles."

Owing to inability to secure dye-stuffs from Germany, the Holt-Morgan Mills of Fayetteville, N. C., are closed down. N. A. Gregg, superintendent of the mills says the period of suspension will be of indefinite duration. The situation is threatening among all the manufacturers making colored goods. "While we have on hand sufficient quantities of several colors to run for a few weeks," said Superintendent Gregg, "other colors are completely exhausted and the mills are informed that no more are obtainable until the ports of Germany are again opened to neutral shipping. Two cargoes of dye-stuffs are due to reach New York within the next ten days, but whether these contain the most needed colors remains to be seen."

Speaking of the general situation, Mr. Gregg said: "This condition, if it continues, will force the closing down in the near future of most of the colored goods mills of the country, and will throw out of employment thousands of operatives and entail universal loss upon these mills. The dye-stuff dealers are distributing such colors as they are able to procure, in proportion to the average consumption of their customers, and have not raised prices except to cover the increased ocean freights and the war risk."

The possiblity of developing the dye-stuffs industry in this country as a result of the discovery by Doctor Rittman of the Bureau of Mines has aroused much interest

among Carolina manufacturers. The mills throughout the South as well as throughout the world have been depending upon Germany as the source of the supply of practically all of the dye-stuffs and the inability to obtain adequate shipments has been occasioning no end of concern. If it is true, as the Government claims, that as a result of Doctor Rittman's discovery tolnol and benzol, basic materials in the manufacture of dye-stuffs, may be produced from crude petroleum, then the great difficulty will be solved. Mill men throughout this section, particularly those who have made a study of the dye-stuffs situation, are apprehensive lest the reports emanating from Washington be exaggerated, although of course they hope that such is not the case. They are awaiting further details of the process.

Leading cotton mill men of Greenville, S. C., believe that the British embargo placed on Germany will seriously affect the industry, though but few of the local mills will suffer on account of a shortage of dyestuffs, only the Duncan mill, manufacturers of shirtings and dress goods, using the dye direct, while the Camperdown has its goods finished in New England though dyes are used in the finishing process. Mill men here are looking forward hopefully to the Dr. Rittman discovery, believing that the government will solve the problem before the shortage reaches an acute stage.

Greenville mills and those in the vicinity of this city have been running on full time for the past several months none having to close down with the exception of one of the smaller mills, which closed down only two days each week for about four weeks, this being at the start of the war.

One of the mills manufacturing shirtings has recently received an order for 1,000,000 yards of goods to be shipped at once. While this is not regarded as such a tremendous order, still it is large enough to give hopes to local mill men. Other mills admitted when asked, that they were having no trouble, comparatively, in disposing of their output and are hopeful that the future will bring great things for the mills of the state.

The Piedmont Hardwood Manufacturing Co., which plant was destroyed by fire several days ago, announced that the plant will be rebuilt at once. This firm manufactures loom supplies, picker sticks, etc., and has enjoyed large business since it was built here several months ago.

The following are noted among the additions, changes, etc., in hand at present, or contemplated:

Contract has been let for a new mill building for the Savona Mfg. Co., of Charlotte, N. C. The company manufactures napkins and towels, and the business has grown so that the enlargement has become necessary. C. C. Lima, of New York, is president, and S. B. Alexander, of Charlotte, is secretary.

The Commonwealth Mfg. Co., of Durham, N. C., is to begin operations again at an early date, after having been inactive for several years. It is said that Brodie L. Duke has purchased a majority of the stock.

The Sidney Cotton Mills, at Graham, N. C., have resumed operations, after being stopped for several months, due to the effects of the European war.

The Millfort Mills, No. 2 mill, Fort Mill, S. C., will be started April 15th, after being idle since September.

The Glenn-Lowry Mfg. Co., Whitmire, S. C., has placed order for 125 new Stafford looms. The Hamilton-Carhart Mills, at Rock Hill, S. C., have purchased the looms which these new ones will replace.

Capitalists at Buffalo, N. Y., and Birmingham, Ala., have announced that they will build a $500,000 cotton mill at Birmingham. Frank A. Dudley, of Buffalo, is the man in charge.

The Sellers Hosiery Mill at Burlington, N. C., is enlarging its plant to increase its capacity 50 per cent. An addition 50 x 70 feet, two stories, is being added to the present building. It is intended primarily to install a finishing plant in this addition, though this will not be done until the dyestuff situation clears up. For the present the addition will be used as an annex to the knitting department, and the finishing will be done as under the present arrangement.

A. J. Dossett, president, Cameron (Texas) Compress Company, contemplates the installation of a plant to bleach low-grade cotton and cotton linters for absorbents, explosives, mattresses and felts.

J. H. Separk, of Gastonia, N. C., is planning to build a new 5,000 spindle mill. No contracts have yet been made.

A new three-story mill is to be added to the Wiscassett Mills Co., at Albemarle, N. C. The new mill is to contain 12,500 spindles, for making cotton yarns. This lot of spindles will come out of the 65,000-spindle order recently placed by J. W. Cannon for the various mills under his control.

Plans and specifications are being prepared for the addition to the Florence Hosiery Mills, of Fort Payne, Ala., owned by W. B. Davis and his son. Mr. Davis was until recently manager of the Davis Hosiery Mills at Chattanooga, Tenn. It is stated that he will add equipment for dyeing and finishing his products at the Fort Payne plant.

The Oriental Textile Mills, of Houston, Texas, have placed an order for new machinery.

The question of a new cotton mill for Texarkana, Arkansas, is being agitated by local business men. Leo Krouse of Texarkana is at the head of the movement.

Whitcomb, Riggs & Co., Barrs Terrace, Jacksonville, Florida, are contemplating the erection of a $500,000 cotton mill at that place. They expect to use Sea Island cotton exclusively in their plant. No contracts have been placed.

The Ensign Cotton Mill at Forsyth, Ga., is to enlarge the mill and double its capacity. Practically 6,500 additional spindles will be installed as soon as the new portion of the mill is completed. Already the work of excavating for the foundation of the new building has begun and the actual work of erecting the addition to the mill building will begin at an early date. A new church and school is to be erected south of the mill; also a number of new dwellings for the additional employees which will be necessitated by the increase in the mill's size.

It is reported that the establishment of cotton mill at Phenix City, Ala., to cost about $150,000 is contemplated. J. T. Bland Real Estate & Insurance Co. and others are interested.

The Kincaid Manufacturing Co., Griffin, Ga., will add 8,500 spindles and 200 looms to its present equipment.

The Southern Textile Company, at Paducah, Ky., will enlarge sufficiently to permit of installing machinery to double the capacity. The work will begin immediately, the contract for the improvement having been let by owner of the building to Gus Lockwood, contractor. New machinery, which will be installed when the enlargement of the building has been completed, has already been ordered.

## NEW ENGLAND MILL SITUATION.

The first three months of the year have proved more satisfactory than cotton manufacturers anticipated when the year opened. Profits have been meagre, but machinery has been occupied. If the dyestuffs trouble had not become so serious since a blockade of German ports was decided upon most manufacturers would regard the outlook for the balance of the crop year with complacency. With a probable surplus of cotton of at least 4,000,000 bales reasonably assured, there seems to be a bright prospect of the export trade developing on a price level that will give merchants an opportunity to establish many American staple goods in markets where they have never been used.

It is this phase of the outlook for trade that is most promising, in the estimation of New England manufacturers. Since the war started, time has been given for a steady consumption of the goods then in hand, and with the trade of many European countries entirely shut off, and the products from other countries more or less prejudiced among compatriot traders in other lands, it would seem as if goods made in the United States would receive consideration not accorded them under normal trade conditions. That this is a correct view of the prospect is shown by small purchases made here already for shipments to ports with which the exporters have not done business in the past.

An examination of the details of cotton goods exports in the past month or two shows that miscellaneous shipments have come to be an established thing at every sailing. The absence of trade from China, and other countries where goods have been sent in other years is not missed so keenly when Canada, Cuba, Mexico, Africa, Australia, and other countries are buying more American goods than they have ever purchased in the textile lines. The shipments of cotton duck are running into large figures.

The dyestuffs situation has reached the point where many lines of colored goods are being withdrawn from sale. It has become impossible for mills making leading qualities of flannellettes to take orders for reds or pinks, and some of them are unable to take further business on fast blacks. Solid colors are hard to obtain. The buyers who have not put down orders for colored cotton blankets are certain to find difficulty in getting deliveries later on. On fancy and plain denims, colored duck, and some grades of tickings, where colors are used largely the mills are doing whatever is possible to discourage late business except subject to an ability to get the dyes required.

The printers are undoubtedly limited in some of the business they could undertake by the scarcity of dyestuffs. Some foreign orders of a sizable character have been submitted and declined through the inability to give the colors sought. A great deal of domestic business has been passed. The costs of printing, finishing and dyeing have been advanced sharply, yet in many instances, despite the advances, manufacturers can make only meagre profits. The advances asked for some lines of colors have been extraordinary. Some of the small dyers have sold out their stocks of certain colors and taken a profit in that way.

A few of the finishers and printers are understood to have entered upon arrangements with domestic dye makers by which they agree to take supplies of certain dyes for two or three years, pending the expiration of which time the chemical companies hope to have established their business so that it will bear competition of a moderate character. The effort of some of the large finishers to bring about a union of all color using interests for the purpose of encouraging the establishment of domestic dye factories failed, but that has not deterred the prime movers of the early movement from entering upon plans which are now working out satisfactorily on a few needed colors, such as aniline blacks.

The market situation at the end of the month is most peculiar. Bleached cottons are very firm, gray cottons have recovered a part of the slight decline noted in the early weeks of March, prints are barely holding their prices, and some lines of fancy ginghams and yarn dyed specialties are only being sold to a limited amount. Concerns like the Amoskeag Company, the Knights, the Berkshire Company of Adams, Mass., and some others that come readily to mind are very busy and fully employed. There are a number of concerns that are running full time but are not operating more than 85 per cent of their machinery. The improvement over last November and December, is marked, however, and with cotton cheap, or under 10 cents per pound, any slowing up of orders will not cause a shutting down of mills.

As cotton has advanced, prices for goods have done no more than hold their own so that the gain that ought to result from enhancing values following a steady demand, has been negligible. At the end of the month there was an advance in some lines of wide sheetings, yet in nearly every important wide sheeting mill in the country, orders are booked ahead that will take care of the output comfortably for some weeks. This is particularly true of certain widths from 63 to 72 inches. Pillow tubings are firm. Fine carded plain cloths such as long cloths, nainsooks, and cambrics are in better demand than for some time, due, it is believed, to the larger use of underwear with ladies' outer garments.

The manufacturers of children's dresses and other specialties in the cutting trade have begun to place orders for another season. Such manufacturers as have styles confined to these goods are putting in orders for an unusual number of fine light colored plaids. This tendency is noted in foreign lines of fine ginghams. Eastern staple ginghams have not been made in as large quantities this year as last, and this is true of many of the yarn dyed staples that are used for romper cloths, boy's suits, etc.

The situation at Fall River has showed little change during the past month. Sales have been large enough to keep stocks from accumulating, but there are nearly 1,600,000 pieces of stocks of various kinds of odd counts still available. For the month of April the mills in that centre are reported as sold for delivery to the extent of 110,000 pieces per week. The American and Algonquin Printing Companies have been running to about 80 per cent of capacity and have been shipping many goods to Manilla this year.

Throughout the Rhode Island district the bleached goods mills have been busy. But many of the small manufacturers of braids, webbing, and other small specialties, have been without a normal trade. The yarn trade has been good in spots. In the mills that make a specialty of supplying certain grades of tire fabric yarns, men's wear warps, or fine thread yarns, business has been good. There has also been business offering to the mills that went into the manufacture of fine grades of crochet cottons to take the

place of the imported goods made in Geormany and Austria. Some yarn mills that have made yarns for special purposes, such as the manufacture of Palm Beach cloths in conjunction with mohair and fine worsteds, have secured business. But there has been a dearth of business on many of the staples used in the knitting and weaving trades and this is expected to continue until the carpet trades and the knit goods trades of the country become active in a broad sense.

In New Bedford, the mills have been fairly busy. They have encountered a labor trouble that is threatening. The loomfixers' union has become quite arrogant in its demands and it has taken the place in labor circles of the old time mule spinners' unions. It is expected at any time that an issue will be made and fought out on the question of the number of looms a fixer shall attend, and on other matters that do not promise now to be adjusted harmoniously.

The retail and jobbing trades have been selling fine wash fabrics and fine white goods more freely than manufacturers were anticipating. The wider skirts that are being worn are having some effect in increasing the yardage of goods wanted for summer trade. Not in many seasons have white goods houses sold fine cottons as freely as they have since the latter part of January. The South has been a better customer during the past month. Orders from any section are not coming in large volume but they are so frequently repeated that the total sales are aggregating satisfactorily.

For skirts, piques, ratines, gabardines, and poplins, are being used in quantities. Rice cloths, voiles, seed voiles, embroidered batistes, and a wide variety of dimity checks and stripes are being called for steadily. The business done on lawns and linons has also been good in volume, although there is complaint that prices are too close to be profitable. On fine printed wash fabrics, the most active selling goods last month were the black and white effects, the discharge prints on silk and cotton grounds, and some varieties of organdies and printed lawns. The real active demand for the cheaper printed wash fabrics is expected to begin among the jobbers during April, and it is thought that it will continue unusually late.

Many silk and cottons are being made. Tussah silk is being bought freely and at advanced prices, while some of the canton silks have been bought liberally. The cotton mills are using artificial silk more freely this year than ever before in this section, notably in hosiery, and in decorations for fine yarn dyed specialties in dress cottons.

The machinery manufacturers say there is a slow improvement in the demand for renewals and repairs. There is as yet no material gain in the way of investment demand, yet some of the large machinery dealers believe that such an eventuality will not surprise them in the next two months. They are relying confidently on developments in cotton goods for export.

## COTTON COMMENT.

BY H. AND B. BEER, NEW ORLEANS.

New Orleans, March 20th, 1915.

In closing our review of one month ago we expressed the opinion that if cotton was not declared contraband of war, and if exports to Europe were not restricted, cotton should prove to be a good investment at the low prices prevailing then, as there is every indication of next year's crop being a small one.

Cotton has not been declared contraband of war, and exports to Europe were not restricted, on the contrary they continued to run far ahead of last year's shipments during the past month. The result is that the price of the staple advanced nearly one cent per pound, and is now at the highest level reached thus far this season.

Trade in England and in the United States recovered the lost ground more rapidly than generally expected, due, in a great measure, to large government orders for European army purposes, and because of the very high prices the United States has obtained for its grain and and food supplies, which are being shipped in unlimited quantities to the warring nations.

For the first time this season the consumption of cotton in the United States was larger than February of last year —463,000 vs. 455,000 bales, making the total thus far this season 3,054,000 bales vs. 3,272,000 for the corresponding period of last season, and it is thought that the deficit of 218,000 bales for the first seven months of the year will be recovered before the end of this season.

Compared with one year ago manufacturers of the United States held a stock of 1,654,000 bales at the close of February against 1,712,000, but stocks in independent warehouses in this country on the same date were much larger than one year ago—4,090,000 vs. 2,314,000, and the number of spindles in operation in America, was 30,777,000 against 31,141,000, indicating, by reason of the larger consumption than last year in February, that the American mills were making a heavier weight goods.

The movement to market was heavy, of record breaking proportions for this time of the year, but as the cotton was in course of transit to Europe and American spinners, stocks, instead of accumulating in the United States, actually decreased, which proved to be more of a bullish than a bearish feature.

At the close of January the stock at all U. S. ports and counted interior towns was 3,275,000 bales compared with 1,945,000 last year, and notwithstanding receipts at all ports since then to have been 1,071,000 bales larger than for the same period of last season, exports have been so big, and takings by American mills so large, that the stock at the 30 counted inland towns and at all United States ports are only 2,945,000 bales vs. 1,510,000 last year, whereas one month ago they were 1,330,000 larger than last year, having lost relatively compared with one year ago, counting the excess in receipts, 1,348,000 bales during the past six weeks. In other words the large excess over last year in the world's visible supply has been gradually shifting from America to Europe, which accounts for the strength recently displayed by the southern spot markets, and which has encouraged the South to demand higher prices for its cotton, and, in some instances, owners of spots in the interior are holding for still higher prices.

Exports during the past week were 256,000 bales against 147,000 for the same week last year, making the total thus far this season 6,148,000 bales vs. 7,544,000 to even date last season. The large exports have been a revelation to many people, who, at the outbreak of the war, were under the impression that exports for the whole season would not be more than 5,000,000 bales, whereas now, if no restrictions are placed on shipping, they may reach last year's total for the season of nearly 9,000,000 bales.

However, the outlook for exports in the future is not

favorable owing to the contemplated blockade of Germany and Austria by England, effective March 31st, and if not modified may check shipments to Europe considerably during the balance of the season, as exports to neutral countries will be subject to seizure on the pretext that the cotton might reach German territory.

Today the United States Census Bureau issued a final report on the total ginnings this season, which, including 722,000 linters, makes a total crop of 16,645,000 bales vs. 16,109,000 in the previous big crop year of 1911. Taking into consideration the unmarketed portion of this year's crop and the world's visible supply of American, the world's available of American cotton today is 9,902,000 bales against only 5,034,000 last year and 6,366,000 in the previous big crop year. These facts show the necessity of the South making a drastic reduction in the acreage this year if the best results are to be realized.

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BY THEO. H. PRICE, IN COMMERCE AND FINANCE.

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Looking ahead it appears not unlikely that the cotton trade may convince itself that the acreage of the next crop is reduced 25 per cent long before any substantial part of that restricted area is planted.

Two circumstantial reports issued the second week in March tend to create this expectation.

Messrs. Jay Bond & Co. have completed an investigation as to the probable decrease in acreage from which they conclude that it will average 25.2 per cent distributed as follows:

| State | Acreage Decrease | State | Acreage Decrease |
|---|---|---|---|
| Virginia | 40.0 | Tennessee | 19.7 |
| North Carolina | 31.6 | Louisiana | 30.1 |
| South Carolina | 25.0 | Missouri | 50.0 |
| Florida | 11.5 | Arkansas | 24.1 |
| Georgia | 24.6 | Oklahoma | 28.4 |
| Alabama | 28.6 | Texas | 23.5 |
| Mississippi | 22.3 | | |

The *Journal of Commerce* has made a similar investigation with regard to Oklahoma and Texas, the result of which indicates that the decrease in Oklahoma will be 30 per cent and in Texas 25 per cent.

These reports are reinforced by the most sensational statements in regard to the sales of fertilizers and mules, which are said to be almost negligible as compared with last year.

The reduced traffic on the southern railways, which, at this season of the year, consists largely of fertilizers, is cited as confirmatory evidence of the tendency to reduce cotton production. Vociferous reiteration can accomplish much in the way of affecting public opinion when no opposing facts are in evidence, and it is altogether probable that within the next two months a genuine belief that next year's crop will be a very small one may become firmly established. If so, much higher prices for cotton are certain and will be maintained until the weight of next year's production commences to be felt.

The market has shown itself responsive to these forecasts and has passed from the realm of fact into that of imagination inflamed by the hope of gain. The possible consequences are hard to measure. The elements of a great speculative conflagration are all assembled and only require ignition to sweep the world.

Cotton is below the cost of production and nearly everyone but a few belated buyers desires an advance. The experience of the past season has convinced the world that next to food cotton is humanity's most essential staple.

Wool is now almost non-existent in a commercial sense, and new uses are continually being found for cotton.

An Atlanta shoe factory has begun to make shoes almost entirely of cotton (as shown herewith), the only

SHOES WITH COTTON TOPS AND SOLES.

thing about them which is not cotton being the heel, made of rubber, and a thin leather welt, to which the cotton belting sole is attached.

The export movement continues on an enormous scale, and by the first of April will be within a million bales of last year.

The demand for cotton fabrics for the purposes of both war and peace is increasing, and the goods markets everywhere are in a satisfactory condition.

From just what quarter we shall get the spark that may start the fire it is hard to say. It may be peace or the rumor of peace. It may be that some foreign government hard pushed to maintain its supply of gold will decide to make cotton the basis of an asset currency and accumulate a large supply at present prices. The United States was not far from doing that six months ago.

It may be that an unpropitious spring will intensify apprehension as to the next crop. There are any number of things that might start a blaze that once started will have to burn itself out. Under the circumstances the wisdom of buying cotton and the foolishness of being short of it requires but little demonstration.

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**STATEMENT**

of the ownership, management, etc., of COTTON, published monthly at Dalton, Ga., required by the act of August 24, 1912:

Editor, L. L. Arnold, Atlanta, Ga.

Business Manager, W. J. Rooke, Atlanta, Ga.

Publisher, W. R. C. Smith Publishing Company, Dalton, Ga., and Atlanta, Ga.

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There are no bondholders, mortgagees or other security holders.

W. R. C. SMITH PUBLISHING COMPANY,
O. A. Sharpless, Secretary.

Sworn to and subscribed before me this 26th day of March, 1915.

JOHN C. MARTIN,
(Seal) Notary Public.
(My commission expires June 24, 1916).

## THE YARN MARKET.

The past month has indicated a considerable improvement in general yarn market conditions, particularly in the amount of deliveries reported on old contracts. New business is in small lots and generally speaking is only fairly good. The early part of the month found some improvement in the demand for coarse carded yarns and the situation bullish. Sales of southern carded cones were made for prompt delivery on the basis of 14, 14¼, 14½ and 15 cents for 10's. Sales of 24's for quick deliveries were made for 17½, 18 18½ cents. Combed yarns in the gray were somewhat dull during this period, especially 2-ply lisle. There was a noticeable improvement in the mercerized yarn situation however, and accumulations which have been growing larger weekly, in some cases practically disappeared. General improvements seemed to have been in the west where the knitters were taking double the quantities they were requiring in January. There seemed to be little demand for weaving yarns, however, during this period.

Later in the month the demand for carded knitting yarns in the Philadelphia market was chiefly for small quantities ranging from a single case to 10,000 pounds. There was a great variation of prices quoted and in the opinion of many dealers there was no stability to prices. There seemed to be too many spinners in need of business for prices to hold at any particular level that would show a profit. Combed yarns continued in rather light demand and mercerized yarns continued to sell in small quantities. The weaving lines remained unchanged but it was believed that a considerable part of the delay was due to unnecessary economy.

Yarn manufacturers of New Bedford are vigorously protesting with the Interstate Commerce Commission against the change in freight classifications as recently announced indicating that the mills must hereafter crate all shipments of cotton warp yarns on beams and crate all empty beams being returned to the mills. The manufacturers claim that this new ruling of the railroad will increase their freight rates on yarns shipped on section beams by approximately 27 per cent, which, when added to the 5 per cent increase which went into effect in January of this year, brings the increase in rate since the first of the year up to 32 per cent.

The latter part of the month still found business confined to comparatively small sales and with the carded knitting yarn situation much stronger than that of the weaving yarn on the Philadelphia market. The spinners are reported to have sufficient business on their books to keep their plants running for the next three months, but in some instances they find it difficult to enforce buyers to accept deliveries. Combed yarns continue in light demand and with a wide variation in prices. Eastern combed peeler on cones was quoted at 22½ cents for 18's. Southern frame spun combed peeler was sold on the basis of 19½ and 20 cents for 10's. Sales of 60's 2-ply combed sea island were made at 59 cents while 80's 2-ply combed sea island brought 70 cents; 60's 2-ply combed peeler lisle were made at 43½ to 45 cents. Some better inquiries have been received in mercerized yarns. Combed peeler on cones, mercerized, brought the following prices: 40's 2-ply, 41½ and 42 cents; 50's 2-ply, 45 to 48 cents; 60's 2-ply brought 57 cents; 70's 2-ply, 63 to 66 cents; 80's 2-ply, 73 to 75 cents. The weaving lines remained unchanged and the prediction is made that unless a material improvement is obtained in the dye and wool conditions, warps for carpet work will be rapidly trending toward a decline.

The following are recent quotations in the Philadelphia market:

**Southern Single Skeins.**

| | | | |
|---|---|---|---|
| 4s to 8s | 13 | 20s | 15 @15½ |
| 10s | 13 @13½ | 24s | 16 @16½ |
| 12s | 13½ @14 | 26s | 17 |
| 14s | 14½ | 30s | 18½ |
| 16s | 14½ | | |

**Southern Two-Ply Skeins.**

| | | | |
|---|---|---|---|
| 8s | 13 @13½ | 24s | 16½ |
| 10s | 13½ | 26s | 17 |
| 12s | 14 | 30s | 18 |
| 14s | 14 | 40s | 24 |
| 16s | 14½ | 60s | 35 @36 |
| 20s | 15½ @16 | | |

**Carpet and Upholstery Yarns in Skeins.**

| | | | |
|---|---|---|---|
| 9-4 slack | 15 | 8-3-4 hard twist | 13 |
| 8-4 slack | 14½ | | |

**Southern Single Warps.**

| | | | |
|---|---|---|---|
| 8s | 13 @13½ | 24s | 16½ |
| 10s | 13½ | 26s | 17 |
| 12s | 14 | | |
| 14s | 14 @14¼ | 30s | 19 |
| 16s | 14½ @15 | 40s | 24 @26 |
| 20s | 15½ | 50s | 32 |

**Southern Two-Ply aWrps.**

| | | | |
|---|---|---|---|
| 8 | 13 | 24s | 16½ @17 |
| 10s | 13½ | 26s | 17 |
| 12s | 14 | 30s | 18 |
| 16s | 15½ | 40s | 24 @24½ |
| 20s | 16 | 50s | 35 |

**Northern Two-Ply Carded Peeler Skeins.**

| | | | |
|---|---|---|---|
| 22s | 18 | 40s | 24½ @25½ |
| 26s | 19 @19½ | 50s | 32 @34 |
| 30s | 20 | 60s | 35 @38 |
| 36s | 23 @23½ | | |

**Two-Ply Combed Peeler Skeins.**

| | | | |
|---|---|---|---|
| 20s | 23 | 50s | 38 @39 |
| 24s | 24½ @25 | 60s | 44 @46 |
| 30s | 29 | 70s | 50 @53 |
| 40s | 33 @34 | 80s | 60 @63 |

**Southern Frame Spun Yarn on Cones.**

| | | | |
|---|---|---|---|
| 8s | 14 @14½ | 20s | 16½ @17 |
| 10s | 14½ @15 | 22s | 17 @17½ |
| 12s | 15 @15½ | 26s | 18½ |
| 16s | 15½ @16 | 24s | 18 |
| 18s | 16 @16½ | 30s | 19 @19½ |

**Northern Mule Spun Carded Yarn on Cones.**

| | | | |
|---|---|---|---|
| 12s | 17 @17½ | 22s | 19½ @20 |
| 14s | 17½ @18 | 24s | 20 @20½ |
| 16s | 18 @18½ | 26s | 20½ @21 |
| 18s | 18½ @19 | 30s | 22 |
| 20s | 19 @19½ | 40s | 25 @25½ |

**Northern Mule Spun Comber Peeler Yarn on Cones.**

| | | | |
|---|---|---|---|
| 10s | 21 @21½ | 20s | 23½ @24 |
| 12s | 21½ @22 | 22s | 24 @24½ |
| 14s | 22 | 24s | 24½ @25½ |
| 12s | 21½ | 26s | 25½ @26½ |
| 14s | 21½ @22 | 36s | 32 @33 |
| 16s | 22 @22½ | 40s | 34 @35 |
| 18s | 22½ @23 | | |

## THE KNIT GOODS MARKET.

It is difficult to size up the export trade possibilities under the present extreme conditions. Some large contracts for men's ribbed drawers have been received and many believe that the European demand for ribbed underwear will eventually be large. Domestic orders are not strong, and jobbers are keeping stock down to the lowest possible point. Selling agents for men's balbriggans in the cheaper grades and also in the 50 cent lines were disposed to view business received from jobbers in a somewhat optimistic way. The heavy weight business for next season seems to be merely marking time, but this is the usual condition at this period of the year.

Around the middle of the month in the New York market conditions seemed to indicate a steady demand for spring underwear and the fact that spring business is moving well at the present time gives satisfaction to the more conservative minded in the market. There is a growing belief with manufacturers and selling agents of men's fleeced underwear that union suits are to sell in a larger way and that shirts

and drawers will gradually be displaced to the extent that the single garments increase. The last of the month indicated a slackening in the foreign business, and the London market in men's fleeced shirts and drawers is said to be in a very irregular and unsatisfactory condition. However, manufacturers of fleeces believe that should the war continue another year, their product will again be in large demand for export.

In the hosiery end of the market, probably the dyestuff situation is creating a more acute feeling than any other single factor. Unless conditions existing at the present time are materially altered, it seems to be the opinion of many hosiery manufacturers and a number of leading selling agents that within a short period of perhaps 60 to 90 days, the trade will be confronted with the full effects of the dyestuff scarcity. Buyers have heretofore not taken the matter very seriously, but should the present situation be unrelieved, the selling side of the hosiery trade will be up against conditions that will be far from theory in the practical difficulties entailed.

The attitude of most of the hosiery mills at present is to proceed in the way of taking new business from the actual situation as it stands and restrict the amount of business they will accept to the amount of dyestuff supplies already on hand. Naturally the heavier lines of goods will be the first to feel this shortage. Orders ore being received in a somewhat irregular manner depending on the sections of the country being canvassed and the position that the jobbers in these sections are in as regards the stock on hand. In full fashioned goods, the silk styles selling for $1.00 continue fairly active although some fancies in the form of stripes and checks are fairly prominent. Two cargoes of dyestuffs are supposed to be en route for New York and just what these ships will have when they arrive is undetermined at the time this is written.

In all probability the dyestuff situation will be thoroughly discussed at the forthcoming convention of the National Association of Hosiery and Underwear Manufacturers in Philadelphia from the 3rd to the 7th of May. Arrangements are being made for an exhibit of machinery fully equal to that shown on previous years, despite the present unstable situation. It is reported that knitters will attend wearing their best smile and looking as cheerful as if a European war and an Underwood tariff were merely memories from a land of dreams.

# COTTON MANUFACTURING.

## SHOE TOP CLOTH.

BY EMIL KAHN.

A comparatively heavy and firm cloth, used for the upper parts of shoes, as its name implies, is at present remarkably popular especially in light colors as for example tan, drab and cream tints.

This cloth is made in a variety of structures and of various materials. The better qualities are made entirely of worsted, while in the cheaper grades cotton is used either in filling or back warp.

The cloth is usually made with two warps, face and back, and one filling. This cloth weighs from 15 to 20 ounces per yard, (56 inches wide).

The weaves most generally used are the corkscrew twills. Fig. 1 shows a type of weave for the face of the fabric. Single cloth structures only are used in the light weight fabric of about 15 ounces per yard, 56 inches wide.

Fig. 2 is the same face weave as shown in Fig. 1 with the addition of a back warp weave. A complete repeat requires 26 harnesses; the pattern shows two face ends to one of back; the solid squares indicate the face weave and the crosses indicate the back. The design shows two repeats of face to one repeat of back weave.

92 ends per inch 2/40 worsted warp, 23 by 4 reed, and 100 picks per inch 1/32 worsted filling. The width in the reed to be 64 inches and finished 56 inches giving a weight per yard of 15 ounces.

In the light colored cloth there are a variety of weaves, used, but most of them are regular warp satin twills. Fig. 4 is a representative type of weave used, and the cloth made with these weaves are known to the trade as "The Dreadnaught." The weave Fig. 4, like the weave in Fig. 2, shows two face ends to one of back, and requires 18 harnesses for a complete repeat, and also like Fig. 2 shows 2 repeats of face ends to one repeat of back ends.

Analysis of the fabric made with design Fig. 4. This weave is almost entirely confined to the black shoe top cloth. Fig. 3 shows a sample of this fabric.

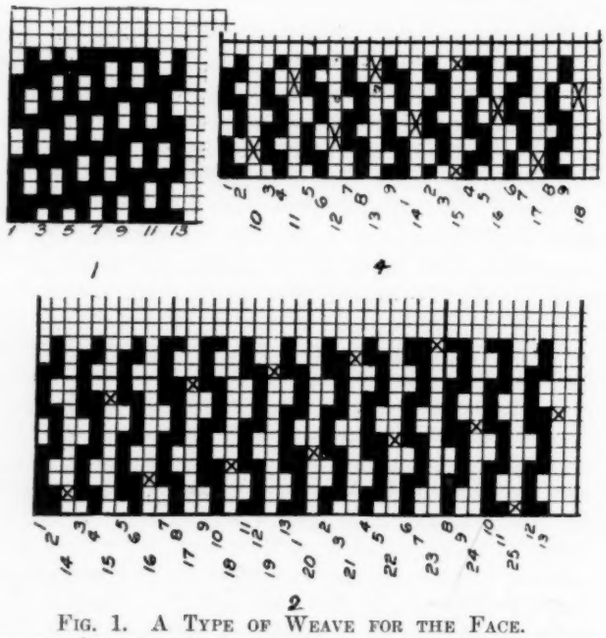

Fig. 1. A Type of Weave for the Face.
Fig. 2. The Same Face as Fig. 1 with the Addition of a Back Warp Weave.
Fig. 4. A Representative Type of Weave Used on the Goods Shown in Fig. 5.

ANALYSIS OF FABRIC.

100 ends per inch 2/60s worsted face warp 25 by 6 reed
50 ends per inch 1/14s worsted back warp 25 by 6 reed

150 ends total.

140 picks per inch 1/36s worsted filling.

Width on reed 64 inches, finished width 56 inches. Weight per yard, 56 inches wide, 19½ ounces.

In finishing the cloth it is fulled or felted considerably, from 64 inches to 56 inches. Care must be taken, however, not to "matt" the face of fabric, that is the idenity of the weave should not be lost as in a cheviot finished fabric.

A lighter weight of fabric may be obtained with the weave shown in Fig. 1 with only one warp as follows: 100 ends per inch 2/50s worsted face warp, 50 ends per

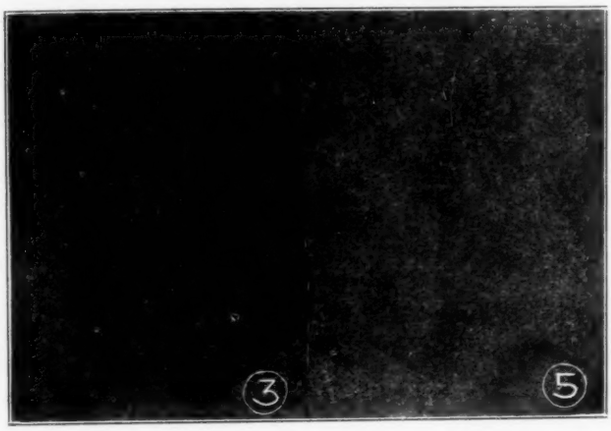


Fig. 3. The Cloth as Woven in Fig. 2.
Fig. 5. A Cloth Known to the Trade as "The Dreadnaught."

inch 2/50s worsted back warp, or 150 ends total using 25 by 6 reed, 86 picks per inch 2/50s worsted filling. Width on reed 68 inches, finished to 56 inches wide. Weight per yard, 56 inches wide, 20 ounces. In finishing the "dreadnaught" cloth the face of the fabric is given a light napp due to the greater fulling, 68 inches in reed to 56 inches finished, therefore the identity of the weave will not be as clear as in the first mentioned fabric. This face "cheviot" effect is, however, considered desirable in the light colored shoe tops. Fig. 5 shows a sample of the fabric.

## INCREASING MILL EFFICIENCY.

BY "NEWCHAT."

In some cotton mills today there is too much tendency to "let well enough alone." Such managements are prone to remark: "We have been running this way for years and the mill is making money; why bother our heads with any new ideas and schemes. We never used to. There is no need of changing things about. We will go on as before."

When a man who understand his business, one who is a real general of efficiency in management, production and cost, arrives at a mill of this kind, he knows very soon how bad things really are. He has to conquer low production, high costs and poor management; also reform the present inefficient corps of assistants, who have been only too willing to let "well enough alone."

Thus the new superintendent becomes a conqueror of men, as he will establish his system of "bustle" and "stick to it" in these assistants, or they will have to step down and let new men assume their responsibilities. He has perhaps already told them "this mill *must* be brought up to a high state of efficiency as soon as it is possible to do so. I expect every man to put his shoulder to the wheel of efficiency and move it upward and onward. A great admiral once said, 'England expects every man to do his duty.' This is the spirit we must have here. This mill expects every man to do his duty; to co-operate with other departments and bring about a healthy, normal condition as regards production, the life of the mill, and at a cost consistent with the surrounding conditions and good management, which always includes square dealings with your help and an interest in their welfare in the mill and out of it."

Such a superintendent came to the mill I am writing about, in which there were carding, spinning, weaving and finishing departments. The first thing to come to notice was the condition of the orders. Some were threatened with cancellation if not delivered within the specified time. These orders were sorted out and those most important laid aside for the superintendent to look over. The "looking up" of some of these orders led to the discovery of a very bad condition, namely the slipshod method of handling the finished product.

In the finishing department orders were held on the tables for weeks at a time waiting for a few patterns to fill out the cases. No one seemed to know or really care whether school kept or not. The tables were piled high with cloth, so mixed that it was well nigh impossible to tell just what was on hand without a lot of overhauling, and even then it was a tough problem to solve.

The superintendent got some of these moving, when a number of customers agreed to take something different from their original order. This helped, but it hurt the mill to resort to a measure of this kind, as the customers, while not being really forced to take what they did not actually want, they were placed in a position where they were glad to get somewhere near what they ordered. Such a condition could not, of course, continue.

This move relieved the situation by putting salable goods on the market and at the same time opened up the badly congested stock, so it could be handled with intelligence and dispatch.

The next step was to get the assortment on the balance of the stock in the finishing department. The cloth entirely finished was taken first and then the cloth on hand to be finished. It was then very plain what could be done with the orders demanding immediate attention.

The overseer of weaving was asked to furnish a list of patterns and styles running in the looms, in order to properly arrange the schedule or layout of looms, so as to favor the balance of the stock left on hand in the finishing room. When this cloth began to reach the finishing room, after this schedule had been working properly a short time, it was indeed a treat to see the way these goods moved onward, through each process to finally be placed under the covers of the shipping cases, and sent on their way to earn dividends and keep the mill alive. There is probably nothing more exasperating in the mill business today as for the man or men responsible, as to be continually making excuses for non-shipment of goods ordered.

The weaving department was next looked over carefully and again a poor system was in vogue. There were warps run out and filling aplenty. This condition immediately showed there was no cooperation. In looking over the warp yarn in stock ready to be beamed or dressed, it was discovered there were a number of incomplete sets that had been available for a month or more, if some one

had only used a little gray matter and brought along the balance of this yarn to complete the sets, instead of letting these looms stand idle, while other sets were being started along in the warping room, that would not be needed for some time. This was a clear case of "fill 'em up." Yarn is yarn. Pounds are pounds. Here was something to stop and at once.

The boss spinner was requested to furnish a list of all unfinished sets on hand. This was done and it was found that at least 30 looms could be started in a day or two, as it only required eight beams to finish up five sets that were on hand. The balance of the sets on hand were made note of and a list made out in duplicate, one for the superintendent and the other for the overseer of spinning. This was done so that the sets wanted could be made complete and brought along quickly when asked for. A form was then made out for the warping department so that the superintendent could tell at a glance when going on his rounds just what was running in the warpers and how far each set had progressed.

This end of the business was so well taken care of after the system was well established that the overseer of the slashing could be told to the hour he could expect the next set to fill in his slashers. This was a new experience for him as he had been continually in "hot water" previously from trying to rush things when he finally got his slashers filled in after waiting many hours for the set to be ready for him. Do not think such things do not happen in the mills of today. There are mills that are making hard, earnest efforts in the direction of efficiency and that leave no stone unturned to accomplish this end. It is alas, also true there are mills that make little effort to clear away the "bad spots" because they don't bring the fault home to its owner, and have it cleaned out once and for all time.

I will mention another incident here that I came across in my experience, and it was only a few short years ago, too. That was my seeing a boss weaver wearing his shoes out chasing up and down four flights of stairs looking for filling for the warps he had left in his looms, and finding the cotton had not yet been dyed. This was an actual condition. Some might ask did this thing happen often? My reply would be, it was a continuous three-ring performance, year in and year out, only it was of much larger variety at times and would wear out a boss weaver about every 12 months. There were three new overseers at this place in four years' time, and they were good men, as they proved later in other mills. It was this lack of system that these men could not fathom, and until some intelligible way was established to prevent an occurrence of this kind, the mill always had this "bad spot."

Now to go back to the slasher man. I remember very well the first set of beams going into the slashers after the new system was started. By new system here, I mean preparing the warps for the looms that were being made ready to receive them, so as to move them along with all possible speed in order to avoid cancellations. These beams had to be lifted over other beams lying around on the floor so thick as to make the process difficult. The boss slasher man was asked what all those beams were and he threw up his hands and said, "I did know once, but they have got away from me. They send down so many incomplete sets, I borrow here and there and I don't really know what I *have* got." These beams were looked over carefully and added to the stock of warps on hand report and for a time it made the busiest little slasher room ever, using up these warps that had been standing idle for so long, instead of running their duplicate in the warping machines on later orders.

More looms were started up on this account. I overheard some weavers talking at noon hour shortly after this "boom" in the slashing department. One said, "things are getting busy; they started up twenty looms on my section this morning." "Yes," said another, "there are plenty of warps around now." I for one knew the reason for this and could not help but think how this seeming prosperity was being brought about. Of course, this increasing of looms would soon drop off, but the yarn was being put into cloth and sold; it was being turned into money. In a very short time all of these beams that were laying around had been used up and the slashing department looked far better as a result.

The yarn was moving in the right direction, leaving the overseer free to think. He could now improve some things that he knew needed attention. When a man is crowded beyond his capacity it renders him wholly incapable of doing his best work. He could now plan the work ahead for his help so as to get the best possible results. He need not be continually sending them home and then sending for them again in a day or two. The slashers would not have to be cooled off, and let stand until the one "shy" beam of a set was made, and the help in this instance told to do anything to keep busy. This overseer actually got along with one man less in his department, owing to being able to plan his work better. As this man received $9.50 per week this was a net saving of $494.00 to the company every year. This would pay for such repairs as new reeds, harnesses, slasher repairs and supplies, etc. There was also a saving in sizing materials and steam, also in waste yarn as there was no rush and confusion.

By close study of the report of beams wanted in the weave room, the spinner was enabled to change his frames to suit the yarn wanted, warp or filling, early enough to avoid confusion and delay. Also to prevent a surplus of yarns not wanted for immediate use. The saving in travelers and in time lost for stoppages over the old "trust-to-luck-change-any-old-time" way, was very noticeable and was a long step toward production efficieney.

The next step was to see that these warps were started on the right patterns so that the orders could be kept moving in the finishing department. This department furnished a list of patterns wanted to balance out the orders each morning. The weave room overseer made out a report on looms running on each style and pattern, and the cloth room sent in a report each day on the amount of cuts inspected of each style and pattern and sent to finishing department. From these reports the general trend of the production could be kept in the right channels. All of these reports were sent in every day and proved a vital part of the new system. They were insisted upon when anyone showed a tendency to lag behind in this respect.

In a short time the finishing department was cleared out of the surplus cloth that had been laying around. The new cloth was coming along in assorted patterns, as shown to be needed by the finishing room report. The tables and cloth bins were kept cleaner, also the cloth was in better shape, not being thrown from place to place, as previously. There was plenty of room for the lots and patterns. The

cases could now be ordered with some degree of accuracy, and be lined out on the floor ready to be packed and shipped.

The result of all this careful planning and systematizing was now being felt all along the line, from the raw material to the packing of the cloth in the case. There was no need to call attention to a batch of threatened cancellations. The superintendents desk was "cleared for action" of another sort. He had established his system so thoroughly and carefully that he was seldom called on to explain a delay in the shipment of any order.

Each department overseer was a link in this chain of efficient handling of the production, and his chance to make excuses was very slim indeed. He could, however, make an enviable reputation for himself, by cooperation with the other overseers who were also links in this chain and the superintendent, who had indicated the way to better results.

A few words here about the packing and getting out of the cases under the old way would perhaps not be amiss. I firmly believe there are some mills today suffering from this same disease and if they would only look into this end of the business they would discover some things very similar to these I am going to describe. In the old order of things, cases would lay around for a week or more waiting for one or two patterns to come along, blocking up the floor space and causing no end of trouble to the employees who were obliged to dodge in and out among them. Dirt and flying dust settled on the papers in the case and finally on the cloth itself. No one thought to keep the cases covered and if they did, someone else would surely uncover them for devious reasons. Then for some reason a pattern would be taken to apply on another order until the assortment of the case would be spoiled entirely. This action would completely tie up the remainder of this order until such time as these patterns could be made. If the order was shipped without this one case, the office would then have to do a lot of explaining.

This was a condition and a bad one, that could not be possible with the new system. When an order came in, the finishing room overseer would make out a list of what he had on hand and send in his report of patterns wanted. The report of cloth sent to the finishing room could be consulted for these patterns wanted and also the looms running on each style and pattern. This would tell at a glance just what could be done with the order on hand. If the orders came strong on a certain style or pattern, the finishing room stock on hand report was consulted and looms taken off on those patterns shown to be in excess of present demands. This report of stock on hand in the finishing room was made out every two weeks. The looms were taken off styles not wanted and put on styles wanted until the orders warranted another change. In this way the production was kept moving intelligently in the right direction.

The goods all ready packed in cases but not wanted for immediate delivery were put in the store house until called for. Thus the floor space for packing or shipping was always available, not being choked with cases of poor assortments, waiting for patterns to come along or cases that had been previously robbed of their chance to become profitable to the company earlier. There is nothing more important than this, as the mill will stand or fall by the care of its finished product.

The store house now demanded attention. The cases were all gone over carefully and a list of cases with their numbers made out. The invoice book was consulted and it was found that some of these cases had been duplicated as the original case could not be located at the time the goods were shipped. Some others were so battered up they could not be shipped and instead of having these cases brought in and repacked they were left to wait until that "later-on-we-will-fix-them-up" time which is always a long time coming. These cases were brought in as soon as found and unpacked and put into stock. These goods should then show on the next finishing room report of stock on hand and would be properly cared for.

The cases were then piled in tiers according to their numbers, the numbers reading in rotation where possible in each aisle. Each set of cases on an order were kept close together so that when they were wanted it was a very easy matter to find them. A report of cases still on hand in the store house was due each month.

By consulting the invoice book it could be seen at a glance just how the storing end of the business stood. There was less chances to duplicate a case or have a case go astray temporarily or otherwise, and was especially valuable on a split order. By that I mean an order to ship cases at stated intervals. It proved a valuable aid to the shipping clerk as he could then be sure of what part of the order still remained to be shipped.

Another feature of the new system in the store house that saved extra teaming, was the arranging of cases on orders that called for different shipping routes. When an order called for more than one route, they were piled according to routing and numbers in rotation, as near as possible. In this way there was less hauling of three or four cases at one time to one shipping station, and then have to go to one or two more stations for the remainder of the load. There was also less wear and tear on the cases, as there was less need of hauling them over to get at a certain case, and then move the cases all back again after finding the case wanted. The cases looked better, were not battered up and the men in the store house had more time to keep things straight and naturally took pride in their work.

The store house must get its share of intelligent management. If it is kept in order as pointed out, the loading of teams will be done quickly, they will carry more pounds per week per team, thus reducing the cost of teaming and as this kind of labor is generally paid by the hour, every hour lost by waiting around the store house means a loss to the company.

It does not matter where the loss is, it means dollars and cents at any point in the mill, and the inefficient handling in the storage and shipping of the finished cloth can help in a great measure to lower the general efficiency of the plant and in some cases it tends to put the mill out of balance.

The result of all this careful arranging of details, this bringing of the shipping and filling of orders up to a state of efficiency in this mill of which we have been talking was a far-reaching and happy one. The orders were now shipped on time, and in some instances better than required. The customers of the mill were pleased and old customers who had been buying elsewhere on account of the poor handling, came back with their orders.

Another direct result of this "hustling," "tend-to-busi-

ness" spirit, was a greater demand for the goods of this mill. Every move or idea that was known to increase the production of this mill was made to keep up with the orders, but they finally had to build an addition on the weave room for more looms and also put in more carding and spinning machinery after the weaving production had been increased.

Prior to this time the looms were all gone over and the speeds noted on each class of work. Some looms were making less picks than others. A number of counter belts were found to be slack, while others were found to be wholly unfit for the work required of them. They were all replaced and re-arranged so as to give the best results. The looms requiring the same speed or picks per minute were grouped together and estimated, after careful figuring and allowance for stoppages had been made. Then the number of yards of cloth estimated from each loom had to come off or there would be questions asked. The belts on the looms had to be kept in good repair, also well dressed with a good belt dressing. The loom fixers were put on their mettle, as the production sheet was divided into sections and each fixer charged with the results from his section. They had to figure for the first time, probably, in all their experience, how to keep the looms running all the time. They followed things so closely that they were preventing costly breakdowns, as each could not afford to have the other fellow beat him out on the yardage at the week end and the result of this vigil on their part was the looms were kept in better repair and production increased. When a warp came out the fixer was right on the job until the warp was in again. He had everything in readiness to swing the warp in and draw it through. Warps had stood in behind looms for an hour previously and no one cared, but now the looms were estimated, even to the time it took for replacing the warp. An allowance was made for this, but there was no allowance made for loafing. It was now the practice to look over the loom chart whenever a new style was ordered to be put in, and a place picked out where the drive would be best suited to the yards estimated as well as the width of loom. Every week end the production was gone over and where a loom fell below the estimate, it was looked into at once, and a remedy applied. If it was the weaver who was to blame there were two prices for the cloth, one at the estimate and the other below the estimate. The cloth was marked every Monday morning right on the loom where the weaver could see it, just how he stood the past week. This system had them all keyed up and they one and all were striving to attain the estimate on all their work and in a short time the weave room production was far above the average asked for, and most of the weavers were doing well over the estimate all around and still producing better work on the whole than before.

The production of the weave room was increased nearly 15 per cent and it assisted in a large measure to help keep up with the orders, but even at that the addition had to be built, and this mill today is a very prosperous concern.

Increasing the efficiency of a cotton mill is not an easy task by any means. To straighten out any of the problems that will be met, so as to secure the highest efficiency means hard work. From the time the cotton is put in the pickers until it is shipped to the markets the mill man has under his charge one of the most complicated systems of industrial activity. So closely related are the machines, one to another, that one cannot be wrong without injuring the combination. To understand the entire combination thoroughly, to be able to swing them all in line and keep them there is a difficult task to accomplish. The successful mill man must do this to be efficient, and not only must he be able to secure complete efficiency of the machines, but he must increase the efficiency of the help at the machines. He must make the help useful and keep them. If he would increase the efficiency and maintain it from day to day, he must train them to follow the master mind. The margin of profitable manufacturing is drawn so close in the mills of today that a leak of any kind is disastrous. The mill man must be ever on the alert to prevent these and as soon as they are discovered he is expected to apply a remedy which will prove effective for all time. He must build up a system; he must fortify his stronghold with the guns of reasoning, and he must use his knowledge to such effect that it can be felt from the raw cotton to the case.

## DESIGNS FOR FANCY COTTON FABRICS.

BY THOMAS WOODHOUSE AND JAMES IRELAND.

PART TWENTY.

The two fabrics illustrated at A and E, Fig. 88, are examples of spot effects, the spots in each case being formed by colored threads introduced at the proper places on the ground of the fabrics. These additional threads used for embellishing a plain or fancy ground cloth are usually

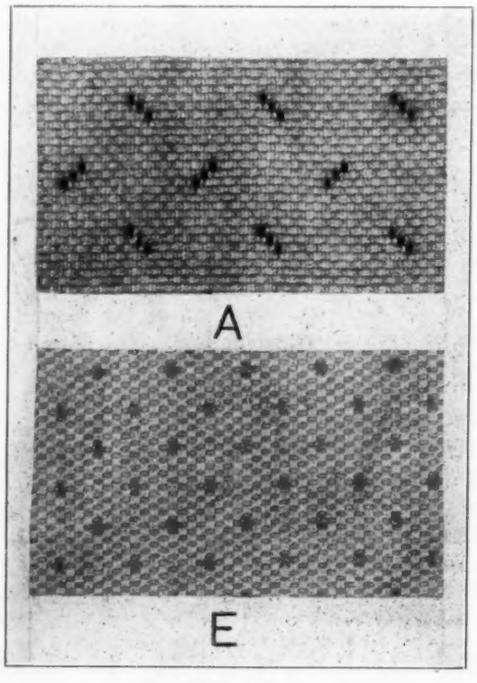


Fig. 88.

termed extra warp threads or extra figuring or spotting threads. The ground weave of cloth A is formed throughout by the 4-thread basket or hopsack weave, but the threads which develop the spots or short bars at right angles to each other come to the surface only at the points where it is desired that the spot effect shall be. The warping par-

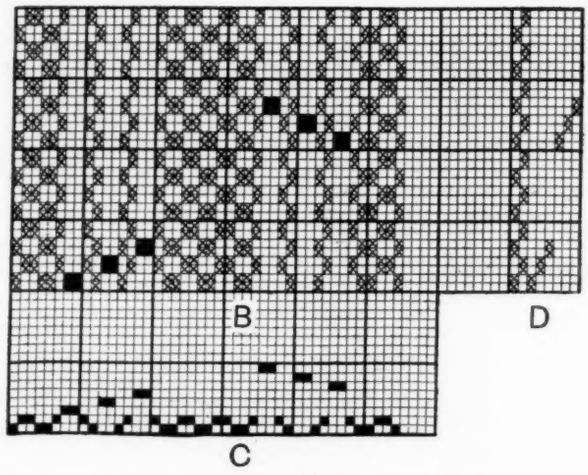


Fig. 89.

ticulars for this cloth are as follows:

| | | | | | | |
|---|---|---|---|---|---|---|
| Slate | 6 | 2 | 2 | 6 | = | 16 |
| Black | 2 | 2 | 2 | | = | 6 |
| Threads per repeat | | | | | | 22 |

The full design is shown at B, Fig. 89, while the draft and weaving plan appear at C and D respectively. The number of threads per inch in such fabrics is usually stated in terms of the ground weave, because of the irregularity of the number of figuring threads in various patterns. If, therefore, we adopt this method, we have:

$$40 \text{ ground threads} + \frac{6 \times 40}{16} \text{ figuring threads, or}$$

$40 + 15 = 55$ threads altogether per inch, and 40 picks per inch of white filling.

The extra spotting threads are shown in solid black in design B, Fig. 89. and it will be noticed that each of these threads appears for 2 picks on the surface of the cloth and then goes to the back for 30 successive picks. In general a dobby would be employed for this pattern, but, if desired, the whole of the ground could be operated by a tappet, and the figuring threads by a dobby. The ground of the cloth would then be firmly and perfectly woven, but at the same time some difficulty in shedding would probably be experienced by the joint action of a dobby and a tappet. It is not uncommon, however, to have two distinct types working on the same loom. The above-mentioned long floats at the back prove conclusively that the face of the fabric only will be exposed to view. As a matter of fact, this fabric would be lined because it is intended for waistcoats. If, for any particular reason, the long floats were objectionable and faulty, the fault would be eliminated by stitching the figuring threads at one or more points.

Another excellent waistcoat fabric is shown at E, Fig. 88. The arrangement of the spots in this fabric is more simple than that in pattern A, but the ground weave is more complex. This will be seen by consulting the design F, Fig. 90, which shows that there are 21 ground threads between the spots, and 3 ground threads between the two groups of the same spot, and that the design stands on 56 threads and 48 picks. Thus, neglecting the arrangement for the two selvages, which would be influenced jointly by the sett of the fabric and the width, we have the following warping particulars:

| | | | | |
|---|---|---|---|---|
| White ground threads | 21 | 3 | = | 24 |
| Blue figuring threads | 2 | 2 | = | 4 |
| | | | | 28 |

The most prominent feature of this cloth is the cell-like effect of the ground. This effect is due partly to the very close setting of the warp and filling threads, and partly to the character of the ground weave. There are 104 white ground threads per inch and 4/24 of 104 figuring threads per inch.

104 ground + 17⅓ figuring = 121⅓ warp threads and 96 picks per inch of white filling. The arrangement of the spots is in the well-known diamond or plain weave base, and so is pattern A, Fig. 88, although the order in the latter does not appear quite so simple as that in pattern E. In both cases the distribution, although doubling the number of harnesses required for the figuring threads as

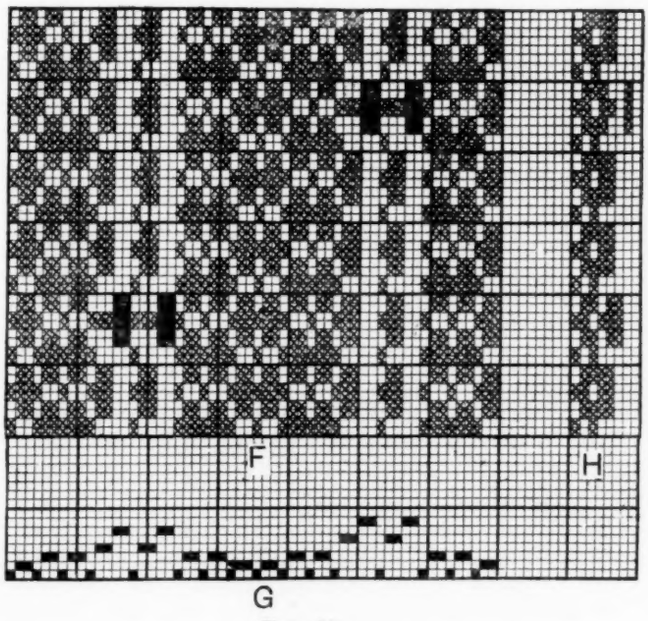


Fig. 90.

compared with a single spot, and often doubling the number of picks, eliminates the tendency to produce horizontal and vertical lines of spots which always appear in the single spot arrangement. It is a general rule to place the threads in the harnesses in the order indicated in the draft G and the weaving plan H, Fig. 90, so that the threads which rise and fall most often are nearest the weaver, but if both sets of threads in any pattern can be woven from the same warp beam, the figuring threads may be placed in the front, since this position would prevent them from hanging in the shed on account of their usual low interlacing order, and would also carry them above the shuttle and filling and thus prevent faulty spots. If, however, two warp beams are used, which is often the case, the positions would probably be as illustrated in the design; there would be a minimum amount of figuring warp used, and little danger of the threads hanging in the shed.

*(To be continued.)*

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The man who invented taxes got up slightly earlier in the morning than the man who invented interest, and since that date he has kept his lead.

## A WARP MOISTENER FOR LOOMS.

The conditioning of warps while in the loom is a question very closely allied to the greater question of humidification. It is well known that cotton, as well as the other textile fibres, has a natural affinity for a certain well-defined percentage of water. This is proved by the fact that bone-dry cotton on being exposed to the normal atmosphere of a room gains weight up to approximately 8 per cent of its total weight. Besides this, however, practice has shown that cotton yarns work best when they contain the full percentage of moisture deemed requisite. It is, however, frequently necessary to raise the temperature of

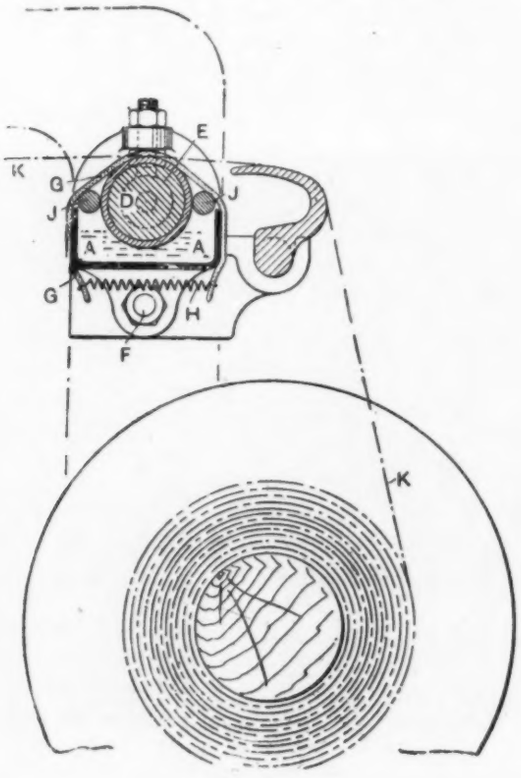


FIG. 1.

the atmosphere in the weaving room beyond the point desirable for the comfortable and energetic performance of the operative's duties. This complication has led to efforts to separate the two influences—that is, to add the requisite amount of moisture to the warp yarn in other ways than through the atmosphere, so that the ordinary temperature of the room may be maintained at a point to secure good results without inflicting uncomfortable atmospheric conditions on the workpeople.

Generally, these devices have taken the form of adding moisture to the warp threads as they are unwound from the warp beam on their passage to the shedding mechanism. An English device of this character, possessing several features of special interest, is illustrated in the diagrams, Figs. 1, 2, and 3. The warp threads immediately after passing over the back rest, pass over an adjustable roller rotating in a trough of water fitted with means for maintaining the water at a constant level. The trough A is mounted in the loom in the manner shown in Fig. 2, and is supplied with water from an airtight container C, as shown in Fig. 3, this device serving to maintain a constant level of water in the trough. The draincock B is provided to permit the trough to be emptied when desired. A roller D is mounted in bearings E, carried by the bolts F, by which the back rest is bolted to the loom frame. The bearings E are made adjustable so that the roller D can be immersed in the water the required depth to convey the right amount of moisture to the warp ends. One or more

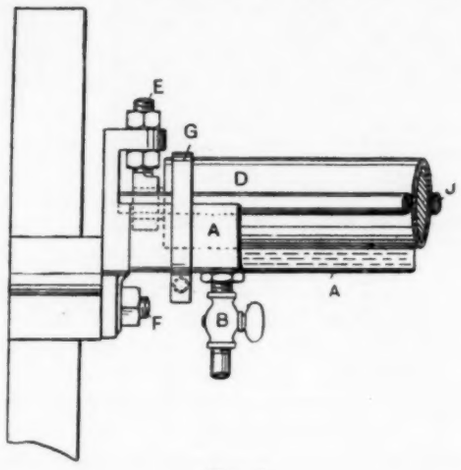


FIG. 2.

straps G are passed over the roller, and connected together by the spring H, to act as a drag on the roller D. The rods J arranged on each side of the roller serve as a cover to prevent the deposit of fluff dust in the trough. The warp threads K pass from the beam, over the back rest, and over the roller D to the heads (not shown), and thus slowly rotate the roller, and at the same time take up moisture from its surface.

Independent experiments have conclusively proved that properly conditioned yarns are stronger than the same yarns are when dry, and this has led to the practice of humidifying the atmosphere by artificial means. It has been stated by those whose experience gives authority to their utterances, that when artificial humidification is prac-

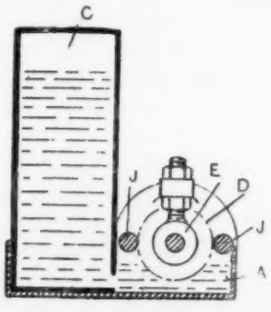


FIG. 3.

ticed in conjunction with a thoroughly efficient system of ventilation, the atmospheric conditions are better from a health point of view than in many of the older sheds where artificial humidification is not practiced at all. This contention is frequently denied by the English operative weavers, although in this country very little trouble of this nature is encountered.

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Government taxes are levied for the purpose of enabling certain citizens, dressed up in regimentals, to kill other citizens also dressed up in regimentals.

# KNITTING DEPARTMENT.

## THE MANUFACTURE OF FASHIONED KNIT GOODS.

BY WILLIAM DAVIS, M. A.

PART THREE.

The making of fashioned knit goods forms a very important and growing branch of the knitting business and an account of the branch would be incomplete without a reference to the orignial machine employed for their production. The first departure from the domestic hand knitting was made when the Rev. William Lee, M. A., invented the hand stocking frame and which persists in its original form with very few alterations till the present day. It still plays a small part in the industry of certain districts although it must be admitted that its days of usefulness are numbered, owing to the rapid decrease of workers skilled in this branch of the service. It is kept alive to a limited extent in Great Britain and on the Continent by the prejudice which exists with some people that all work made on power machines is inferior in quality and these resolutely demand that their garments shall be made on

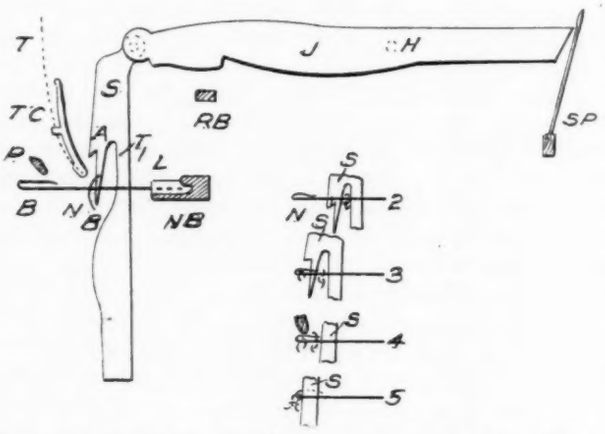



Fig. A. The Essential Portions of the Hand Frame.

the hand frames, although they have to pay an enhanced price for such luxuries.

Although the hand frame is no longer of value as a commercial asset for the manufacturer, yet it is instructive to study it with a view to obtaining an accurate first hand knowledge of the principles of knitting and for this reason it is to be found in most schools of knitting, as its working gives an excellent ground work for subsequent progress in machine knitting. The old hand frame workers were renowned for their skill in manipulating the various problems of size and shape, a skill not always found in the power frame worker. In Figure A is given a sketch of the essential portions of the hand frame which combine to secure the formation of the loop. The yarn T proceeds through the eye of the thread carrier T. C. which feeds it into the nose of the sinker S. The latter is connected with the horizontal jack J, which has its fulcrum or turning point at the point H. The jack is connected to the sinker in such a way that the latter has a free movement on the connecting pin so as to permit of the backward and forward motion in knitting. The jack is kept in position by the spring Sp, when no knitting is being performed. The resting bar R B controls the movement of the sinker in a downward direction during the forming of the loops. The sinker is noticed to have two noses A and B and an opening or throat $T_1$. The needles N are arranged horizontally and are fixed in leads L which are all united in a needle bar N B. The needle is of the spring variety having its spring or beard at (b). To complete the essentials for knitting are required the presser P which is arranged on a lever so that it can be brought down onto the springs of the needles at will.

### FORMATION OF THE STITCH.

The stitch as formed on this machine is shown in the Fgures 2, 3, 4 and 5, which give the various stages in the process. In Figure 2 the sinker is seen to have sunk to beneath the level of the needle and to have caught the thread which has been laid over the needles by the thread carrier. At this stage it should be noted that the former loop is in the throat of the sinker and that the new yarn is under the first nose A of the sinker. In Figure 3, the sinker is seen to have moved froward and placed the new yarn under the spring of the needle, the old loop still being in the throat of the sinker and out of reach of the spring of the needle. In Figure 4 another stage is given when the presser P is brought down on the needle springs and the sinker, having been brought forward and raised upwards, is engaged in placing the old loop over the beard or spring of the needle. In the final Figure 5 the sinker is noted at its extreme position, the old stitch has been successfully knocked over the end of the needle and the new loop drawn through it.

The throats of the sinkers are next brought down to push the new loops back to their position on the needle shanks, a position necessary for them to prepare for the next course. The method of forming the loops just described may be taken as typical of loop formation on all kinds of flat frames of the spring or bearded variety. The whole width of fabric has its new loops laid over the needle by the thread carrier or guide, they are then formed all at the same time by a collective movement of the sinkers and they are all taken back together on to the butts of the needles. This principle of collective formation of succeeding courses is said to explain the regular and even nature of the fabric which characterizes the cloth made on this kind of machine. Fabric made on the spring needle has always a cover and finish which is absent from fabric made on the latch needle machine. In the latter variety, each loop has to be formed on its own needle which has a separate movement as distinct from its neighbor and it will be seen that the tendency for the minute irregularities to appear is somewhat increased. It may be explained in this way, but whether or no the explanation is correct in every detail, it is established that the stitch formed in the way illustrated for the hand frame gives excellent results in the quality of the knitted fabric produced.

The idea of the first inventors of automatic spring needle knitting on the straight-bar machine seems to have been to render the movements of the machine already in existence fully automatic. The leading endeavor was to do away with the troublesome hand operators for we find that the first machines driven by power were almost exact copies of the essential features of the hand frame, except that the movements were brought about entirely by power. It is also interesting to note at this early stage that the cam was employed which has always been, and remains today, the predominant principle of rotary frame construction and which contributes in no small degree to the smoothness of motion and the accuracy of movement of the various parts.

In the first automatic knitting frame, the thread carrier was actuated by a cam and the needles and sinkers by the same means, but the placing of the constituent parts was practically as they appeared in the original hand frame. In the first power machines the speed was little in excess

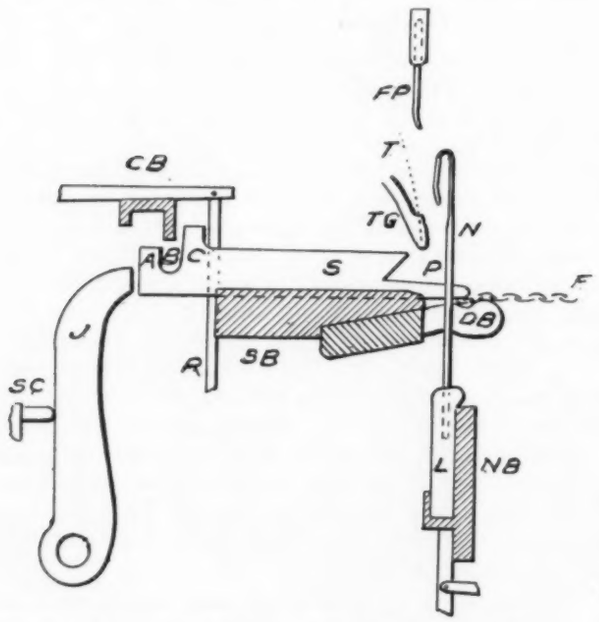



Fig. B. Arrangement of the Stitch Forming Parts of the "Cotton" Machine.

of that of the hand frame and it was not until some time later that it occurred to the inventors to construct the frames in divisions so that several garments could be worked at the same time, from the one set of cams and working tackle.

It was left to William Cotton, the Loughborough machine builder, to revolutionize the system of knitting and to introduce improvements which have combined to make the "Cotton" system of machine knitting perhaps the most perfect in existence and the best adapted for the manufacture of fashioned articles. His chief alteration lay in the position of the vital parts of the machine where the arrangement of the sinkers and needles were completely altered, parts which before were stationary were made to move and other portions formerly movable were now converted into fixtures. Figure B is a sketch of the arrangement of the stitch-forming parts of the machine where it will be noted that an entirely different arrangement of jacks and sinkers has been devised. The sinker S is horizontal, working between the grooves of the sinker-bar SB. To the front of the sinker-bar on the right hand side is the presser P which is merely a bar fixed to the sinker-bar. The needle moves to the presser in this machine instead of the presser moving to the needles as in the earlier inventions. The needles N are arranged vertically with their beards turned inwards away from the fabric and having their leads L all fixed together in the needle-bar NB. Over the needle bar are screwed plates at short intervals and these secure the needle leads in the bar, with the advantage that if it is desired to remove the needle through some cause, the small plate corresponding is unscrewed and the needle expeditiously removed and another inserted.

The needle bar NB is connected by a series of levers to the lower part of the frame whence the movement for the needle bar and with it the needles is derived. The jack J in the diagram is vertical and is pivoted at its lower end on which it acts as a fulcrum. During stitch formation the jack works backwards and forwards, the forward movement being brought about by the slur-cock SC which works at the back of the jacks and is made to traverse the frame from one side to the other at each course. The thread T passes through the thread guide TG and by the latter is placed in front of the sinkers. An important part of the operation of stitch formation is played by the discharging bit DB which assures that the stitches formed shall be completely and thoroughly knocked over the end of the needles. The fashioning points FP are arranged over the needles as shown in the sketch and receive their movement from a bar to which they are attached from above. The fabric F is drawn off to the right horizontally and is at once passed round a roller by the action of weights hanging down in the frame.

On the left hand extremity of the sinker will be noted its peculiar and distinctive formation. It requires this form in order to fit the catch-bar CB which is the means adopted to give the sinkers an out and in motion between the needles. If the catch-bar be pushed forward to the right in the position shown, it will move the sinkers by coming against the part C, a movement which is necessary to sink the yarn between the needles of the frame. When, on the other hand, it is required to bring the sinkers back in a body to the starting position again, the catch-bar CB drops into the groove B of the sinker ends and draws them all to the left.

The needles, which in the earlier machines were stationary, in the frame under consideration are movable and the movements necessary to form a stitch are in two directions, namely out-and-in, and up-and-down. To produce these motions the needle bar is acted on by two lever sets which in turn are controlled by two cams.

The sinkers also have an out-and-in motion during the formation of the stitch which is produced by the slur-cock and the catch-bar. The slur-cock has a quite simple motion from side to side of the frame from right to left and reversed from left to right. The jacks are pushed against the sinker ends and the latter are pushed forward to force the yarn between the frame needles. The catch-bar is controlled in its up-and-down motion through the rod R, the catch-bar sinking into the grooves B of the sinkers when it is required to bring them back in a body to prepare for the next course. Along with the slur-cock moves the thread guide TG, the latter being arranged to travel a little in advance of the former so as to lay the yarn in front of the needles prior to the pushing forward of the sinkers.

In all but the coarsest frames it should be explained that the sinkers are arranged alternately in two forms, one the sinker as given in the sketch and the other a "divider." When the loops are sunk over alternate needles by the jack-controlled sinkers, the dividers are pushed forward by the catch-bar and so divide the yarn equally over all the needles.

A full view of one type of the "Cotton's Patent" frame as used in the hose and half-hose trade is given in Fig. C, which is fitted up for making 16 articles of hose at the same time, termed in the trade a 16-at-once frame and the divisions can be clearly noted in the illustration. The machine is driven from the belt and pulley D on the left from which the motion is communicated to the main shaft S by means of toothed wheel gearing. The main shaft extends the whole length of the machine and carries all the cams for working the parts required to make the course of loops. The fabric roller FR may be distinguished in front and the fabric is kept at the requisite tension by adjustable weights which are hung over the pulley M by a cord. The fabric roller gradually winds up the cord and the worker has to be watchful and release the coils of rope before the fabric loses the tension. The weights can be added to or reduced according as it is required to make a looser or a tighter stitch.

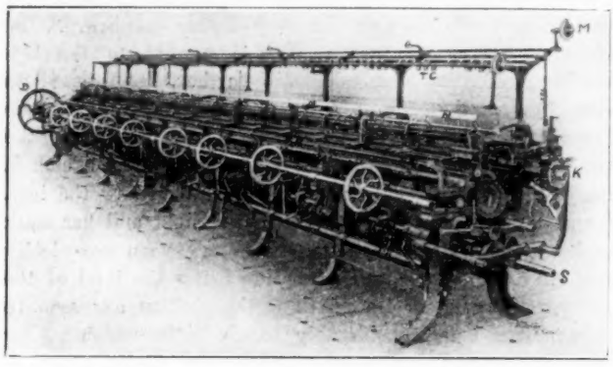



Fig. C. "Cotton's Patent" Frame.

The main shaft S carries all the cams for the working of the various stitch-forming parts but side by side with these are to be found the cams which actuate the needles and sinkers when the machine is fashioning, that is when the fabric is being widened or narrowed by the extension or reduction of the number of stitches in the width. The machine has, therefore, two phases in its working; the first is the series of movements concerned in the ordinary knitting courses, and the other concerns the movement of needles, sinkers, etc., when the fashioning is being performed. Now these two operations obviously cannot be performed at one and the same time; when the machine is knitting, it cannot fashion and vice versa. For this reason the knitting and fashioning cams of the frame are found side by side on the main shaft S and they have a common level at which point the whole shaft is moved sidewise and the actuating levers transferred from the one set of cams to the other. These changes are very effectively brought about by what is known as the "clawker mechanism" which is fitted with a series of toothed wheels marked with the different intervals of fashioning employed, and by the simple operation of bringing down a catch the desired interval can be brought into work.

The place at which the fashioning points are made to work is seen at K which being connected by a screw can be made to turn the points at every division across the frame. The rate at which the fashioning is carried out influences considerably the speed of production of the frame. If the fashionings are frequent, the speed of knitting is correspondingly reduced. Thus it is sought to arrange the making of garments so that the machine starts at full width and is narrowed down for the fashioning, because in this way, it can be effected two needles at a time. If the fashionings are produced by widening the stitches, then they cannot be made more than one needle at once which gives only half the speed in fashioning. If the fabric is widened two stitches at once, a large imperfection would appear in the shape of a considerable opening in the work.

The wheels, seen at each division of the frame connected with the pulley D, are for the convenience of the worker who can use them to control the movements of the stitch-forming parts, when rectifying the courses after some imperfection has occurred. By the improvements to this machine, if a defect occurs in one division which cannot be at once remedied, it can be placed out of action and the other divisions proceeded with as before. When on full fashioned work, each machine requires an operator and usually claims his undivided attention to insure the maximum production. The yarns are set on the back portion of the mechanism and have their threads passing through the divisions TC on their way to the thread guides at the needle points. The yarns are always wound with the utmost care and precision onto the largest possible bobbins. If the threads are crossed or overlap in their layers on the bobbins, constant and immediate trouble is caused to the operator for the yarns get caught and break giving what are known as "press-offs." The yarn fills at the needle head and the entire width is discharged from the needles and has to be replaced again by hand, an operation causing considerable loss of time and reduced production.

The frames are built with a different number of needles to the lead according as the frame is coarse, medium or fine, this arrangement being rendered necessary by mechanical considerations of space allotment in the machine. In gauges of machines up to 8 needles per inch the single needle lead may be met with, and from this sett up to 20 needles per inch the needles are arranged two in the lead; above this fineness may be found three needles in the lead. The coarse gauges are required to be made one needle to the lead to give the strength necessary for working. The strain of knitting is considerably increased on the individual needle when the gauge is coarse. In the finer gauges the strain is distributed over a larger number of individual needles and so they may be leaded two together. The custom of varying the needles in the lead for coarse medium and fine gauges has given rise to some confusion in the matter of gauging the machines as indicated in an earlier article. To determine the gauge it has always been the custom on this type of frame to measure the leads which occupy the space of three English inches, irrespective of the needles contained in the lead. It will be seen that the relative gauge based strictly on this system became a matter of great confusion, because in addition to knowing the gauge number, it had to be stated whether the frame was one, two or three needle in its arrangement. More recently, however, there has been a tendency for these difficulties to disappear and this is especially the case in America where it is practically recognized that the gauge number is understood to mean that the needles of the frame are

cast two in the lead, so that the gauge number doubled gives in every case the needles which cover three inches and by this means a uniform basis of gauging is maintained, a matter of considerable practical convenience.

A study of the arrangement of the stitch-forming parts as shown in Fig. B gives some idea of the problems which face the machine builder in constructing the frame. Take for example a 30 gauge machine which is commonly in use in the trade. By the gauge system we have 30 leads covering three inches, each lead having in it two needles. This gives 60 needles on a space of three inches or 20 needles per inch. Now this space is only to a fraction occupied with the needles, for in connection with the needle we have to accommodate the sinker between each, leaving on either side sufficient space to allow for the working of the yarn as well as for its actual diameter. That is the space of a needle has to be shared by a sinker thickness and two thread thicknesses with an allowance for the free working of the yarn between the needles. Thus in the frame under consideration there are 4 times 20 units of space required. In addition let it be considered that the sinker must pass exactly between the needles in the centre position, if it deviates from this point by the shallest fraction a corresponding imperfection is plainly visible the whole extent of the fabric, which will considerably reduce the value of the product to the manufacturer.

When it is considered that these details of space are

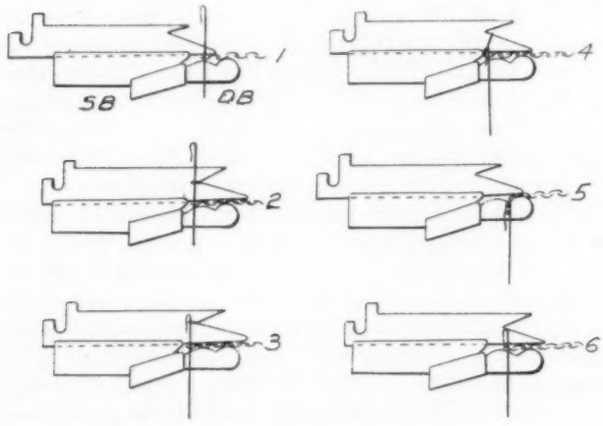
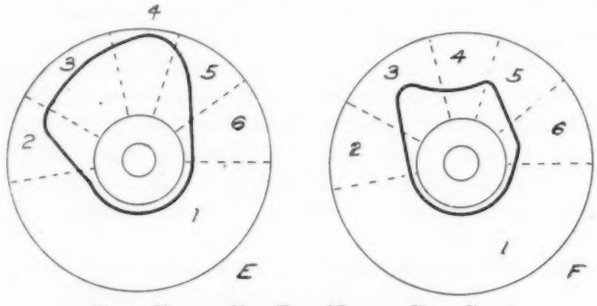



FIG. D. A STUDY IN STITCH FORMATION.

determined by the adjustment and working of levers from cams on the main shaft, it will be understood that the question is one requiring great skill and experience. Should one of the cams not work true, it may be sufficient to cause in an instant damage to the extent of several hundred dollars. These dangers are reduced to a minimum when the machines are under care of a skillful mechanic who understands not only how to remedy the machine, when it goes wrong, but who has the instinct of spotting the defects as they are in course of occurrence and can adopt timely measures. A worker of this type is of the highest value to such a concern and in fact is well nigh indispensable.

In order to acquire this experience it is first of all necessary to understand the principles governing the working of needles and sinkers and a knowledge of the construction of the cams which produce the necessary movements for stitch formation. Diagram D is given to demonstrate the movements of the different parts during the evolution of the stitch and it will be noticed that the sinker bar SB remains a fixture throughout, along with the discharging bits DB and to study the movements of needles and sinkers, the changes in position should be noted in relation to these two fixed pieces. In sketch 1 the sinker and needle are given in the position ready to receive the yarn over the needle shanks with the fabric down on the needles and under the ends of the sinkers. In sketch 2 the sinkers have been pushed forward to force the yarn between the needles and to sink the loops. In sketch 3 the sinker is in approximately the same position but the needle has sunk and is seen with the new yarn or loop under its beard. In sketch 4 the sinker has receded somewhat to the left and the needle has descended still further, has pressed its beard against the edge of the presser and at the same time has received the old loop onto the beard ready for the knocking-over process which is seen completed in sketch 5. For the latter position the sinker has moved to the left, the needle has yielded somewhat to the right and has sunk to its lowest position, drawing the new yarn completely through the old loop by its position below the level of the discharging pieces. In sketch 6 the sinkers are seen to have moved very considerably to the right which is for the purpose of "holding-down" the loops on the stems of the needles as the latter rise to the position required for the starting of a new course.

In this series of movements it will be noted that the needles have a two-fold motion and likewise the sinkers a simple motion. The needle movement when studied with the machine in motion seems rather difficult to comprehend,




FIGS. E AND F. THE NEEDLE-BAR CAMS.

but if the resultant motion be regarded as a combination of two simple movements, it will at once be understood. In the case of the needles, the movements are compounded of a simple up-and-down motion, and an out-and-in motion. In the case of the sinkers the movement is only out-and-in, and it is given by the action of the catch-bar.

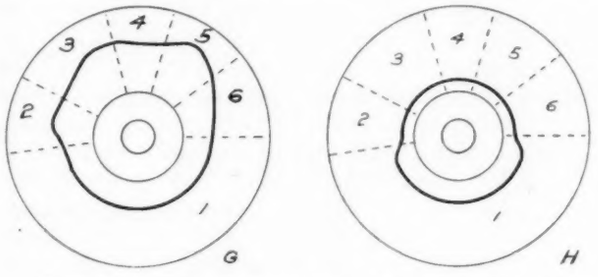
The principle of bringing about those movements is explained by the sketches of the cams used to control them. The needles are all fixed in one bar called the needle-bar and this bar is given its movement from the two needle-bar cams of illustrations E and F. The first cam is that used to give the needle-bar its up-and-down motion, whilst the second cam is to give the out-and-in motion.

The figures showing the forms of the cams are divided into sections which correspond to the stages given in the series showing the stitch formation. The large division of stage 1 in E coresponds to what is known as the draw, when the thread carrier and slur-cock are traversing the frame to lay the yarn over the needles. In stage 2 the form of the cam makes a sudden rise which is the cause of the correspondingly sudden fall of the needle. The form of the cam steadily rises in divisions 3 and 4 reaching

its highest point in division 4 whch corresponds to the lowest point in the needle in stage 5. In the portion marked 6 the form of the cam becomes rapidly lower which corresponds to the rise of the needle-bar to the original position once more.

The cam drawn in Figure F gives the form for the out-and-in movement of the needle which can also be traced by comparing with the stages given in sketches 1 to 6 Fig. D. The needles are stationary again during the draw of the frame and in divisions 2 and 3 the form of the cam rises to correspond with the movement of the needles to the left the high point in division 4 corresponds to the position to the extreme left occupied by the needle in being pressed. Throughout divisions 5 and 6 the form of the cam is reduced to correspond with the movement to the left which enables the needle to clear the loop in rising for the new course.

The working of the sinkers in the way indicated is also necessary for the complete and final formation of the loop




Figs. G and H. The Sinker Operating Cams.

and the catch-bar which controls the movement of the sinkers has two cams for its operation. These are sketched in Figures G and H. The first cam G is used to produce the out-and-in motion of the sinkers, whilst the next cam H, gives the up-and-down motion to the catch-bar which is necessary for it to come into contact with the grooved end of the sinkers. During the draw of the frame the catch-bar is free from the ends of the sinkers which is indicated by the high portion of the cam and during the subsequent portion of the course, the catch-bar is in contact with the ends of the sinkers which is given by the low part of the cam. The form of the cam is thus seen to be in exact accordance with the motion required and the degree in which the form of the cam rises is an exact indication of the speed of motion. The gradual curving of the cam has also a direct influence on the smoothness of the motion.

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The cashing of a number of worthless checks, purchasing supplies and not paying for them, and successfully perpetrating other frauds by a young man posing as an engineer of the United States Geological Survey engaged in special work on Green, Grand, and Colorado rivers would not have been possible had the victims asked to see the identification card with which every field man of the Geological Survey is provided. Such cards carry the engraved signature of the Secretary of the Interior and the personal signature of the Director of the Survey, Geo. Otis Smith, as well as the signature and photograph of the employee himself, with the seal of the United States Geological Survey stamped through all three. This may be worth remembering.

## THE MANUFACTURE AND FINISHING OF HOSIERY.

BY "KIM."

PART THREE.

I shall devote this article to the cost of manufacturing infants' stockings and give the methods of obtaining this cost. How many manufacturers today can tell the exact cost of each size and number they manufacture? Very few. Figuring cost is in my opinion the one great consideration and in such figuring, great care must be exercised. Let us take the method usually used by the writer, and which has been proven satisfactory.

First the manufacturer must know the exact cost of the yarn, when the yarn enters the winding room, this includes the cost of the yarn to the spinner, cost per pound for dyeing, and freight and cartage to the mill. Allow 3 per cent for shrinkage between the spinner and the dyer and cost of handling the yarn in the stock room.

In getting the cost of goods, it is well to figure each size separately as in large sizes more material is required and less production, thus increasing the cost. At all times when getting at cost figures, I figure on a basis of ten dozen of each size in the style.

In getting the overhead cost, the figures must be based on mill production, the exact number of working days in the year and the possible production of the mill divided by the working days; allow for holidays, Saturday half holidays and the annual vacation. Take the possible production of the mill and allow 5 per cent for machines idle by sickness of operatives and other uncontrollable features that will arise, this gives the daily production of the mill. In overhead charges should come rent, light, heat, water, power, taxes, insurance, interest on investment, depreciation on equipment, office expense, supplies and repairs for machines, and all salaried men who receive full pay at all times. Figure all these items to a daily cost, total and divide by the daily production and we then have the overhead charges per dozen.

Some manufacturers figure on the middle size in number. This line I have described is made in sizes 4 to 6½, a total of six sizes. We will take size 5 in making this cost. Size five is 11½ inches long from slack coarse to welt and will weigh about 8¼ ounces per dozen. In making the ten dozen, first the length of the leg must be correct as well as the weight, as cost cannot be figured when the goods are either too long or too short. We probably have an idea of the yarn required to make up the goods, and give to the winder, say ten pounds of the desired color, also about twelve bobbins which have been weighed without any yarn on them. Place a sticker of some sort on the top of each bobbin so identification will be possible later on. Keep a record of the weight of the bobbins, and have the winder operator place the yarn on these bobbins, keeping every particle of waste. When the yarn is on the bobbins, weigh them in this condition including whatever waste there may be. This weight should correspond with the first weight of the yarn and empty bobbins, and if the figures do not show the same, an error has been made by the winder operator becoming confused with the yarn or bobbins. If care is taken the figures will compare.

Next give the rib knitter one bobbin to start the desired

machine, the operator returning the bobbins as fast as empty to the foreman, who in turn exchanges a full bobbin until the ten dozen are knit. The operator must keep each piece of waste and return these when the test is finished, placing some sort of special ticket on each dozen. Weigh the ten dozen, make a note of the total, and at some time divide by ten to get the average weight per dozen.

Now comes the footing of the legs. Again use yarn out of the ten-pound lot as for the body. Weigh one or two cones of silk as desired, also one cone of cotton. Keep a record of these weights and place a sticker on each cone. Have the operator on the footer keep all ravelings and return these with the surplus yarn, including the footing yarn, silk and cotton, with the goods when completed. It may be well to also keep record of the time required to knit the legs on the rib machine, as well as the length of time to foot. Get the total weight of the goods in this condition, including waste from each operation, as all the yarn is now in stockings. Weigh the silk cone or cones returned, the amount of silk used in the test being the difference between the first and second weights. Handle the cotton in a similar manner. There no doubt will be a surplus of footing and leg yarn, so taking the twelve bobbins marked by the stickers which do, or have contained yarn and get the total weight; deduct from this the weight of the twelve bobbins when empty and this will give the weight of the surplus yarn which does not figure in the goods. Now secure the total weight of the footing and leg yarn, and with the silk and cotton, this total should correspond with total weight of the goods after they come from the footer. If there is any great difference some error has been made and the test will not be satisfactory.

It is unnecessary to weigh back or get the total weight of the goods after footing only to prove that the weight is correct and that no one handling the goods has committed any blunder. While, beforehand, the process may seem somewhat of an undertaking to the foreman, after making a few tests, he will find this a very easy and practical method, and one which, if care is taken, must finish and balance correctly thereby allowing the manufacturer to know the exact cost of each size and style. A form for properly keeping the data on this cost test should include the following items:

Date of test.
Size.
Color.
Number of dozen used in test.
Average weight per dozen.
Cost of worsted yarn per pound when delivered to winder.
Cost of spun silk per pound.
Cost of cotton yarn per pound.
Cost of winding worsted yarn.
Cost of knitting, cutting and inspecting rib legs.
Cost of topping and footing rib legs.
Cost of inspecting.
Cost of looping.
Cost of turning, inspecting and mending.
Cost of boarding and pressing.
Cost of inspecting, pairing, folding, ticketing and boxing.
Cost of boxes complete with band and label.
Cost of seconds in test.
Cost of packing case, per 100 dozen to case.
Cost of packing, carting and shipping per 100 dozen to case.
Cost of overhead charges.
Cost of selling production.
Total.

Divide by the number of dozen used in the test and the answer will be the cost per dozen.

It must be remembered that production will be greater on some numbers than on others. This is due to weight and length, the shorter and lighter the leg is knit, the greater will be the production from the rib machine; while on the footing the more double stitches, generally the slower the topping and the less the production from the machine. Then, again, a machine making size 6½ will not produce as many goods as a machine working on size 4, therefore, it is well to figure the cost on each size separately, and take into consideration that the production will be much smaller on large than on small sizes; also that the overhead charges remain about the same and on small production the overhead charges per dozen will be greater.

These goods usually sell at a set price per dozen for the round of sizes set by the mill; again they sell on what is known as the rise and fall plan, starting at size 4 and raising on each size. The mill may secure order for sizes 5½ and 6½ only and with no small sizes on the order, therefore, a higher price must be obtained.

There are several ways of selling, namely, the commission merchant, direct to the retail trade, direct to the consumer, and to the jobbing trade. To sell direct to the consumer requires extensive advertising. To sell to the retail trade the mill must carry a large stock in order to be able to fill orders promptly as 80 per cent of the retail business calls for immediate delivery. In selling the jobber the orders are usually large and are booked ahead, while the price is less per dozen. At the same time, in figuring the cost, if selling to the jobber, the manufacturer has no selling commission to figure, while if selling direct to the retail trade, the salesman receives either salary or commission or both, and if paid a salary it will be a very hard matter to figure the selling cost before the end of each year.

In certain seasons of the year a salesman will make a trip and sales will be large, while on the following trip, the expense will be the same and the sales will be very light. About the only way to get at the cost of selling, if the men are paid a salary, is to figure at the end of the year the salesmen's salaries, plus the expense of all trips, against the amount of business secured.

It is well to make a good stocking; one that will have a good appearance and at the same time give satisfaction to the purchaser. Such goods can be placed on the market under a brand and if the consumers are satisfied, this special brand will soon become known and in demand. ***Quality, service and satisfaction to the consumer are the best advertising methods known.***

In a previous article mention was made of making this line of goods from merino yarn, also plaiting a worsted thread on a cotton back. For the benefit of knitters and manufacturers unfamiliar with these terms, I will state that merino yarn is composed of a percentage of cotton and worsted, while the worsted used is very often domestic wool, or a percentage of Australian. For instance, we want a merino yarn known as 80/20 this means 80 per cent worsted and 20 per cent cotton; again this same yarn may be made up of 50 per cent Australian wool, 30 per cent domestic

wool and 20 per cent cotton. To determine the amount of cotton in merino yarn, take say, 100 grains of yarn, boil for ten minutes in an 8 per cent solution of potash or soda, dry, then weigh the remaining portion which will be cotton, the wool having been entirely absorbed by the solution, the per cent of cotton in the yarn will be the weight remaining.

Plaiting is a term used in knitting, and the method is to have an expensive thread come to the outside of the stocking and place a cheap thread on the inside. This is done by having one bobbin of yarn on the yarn rack attached to the machine, revolving with machine, while the other bobbin is stationary on the back of the machine. These yarns must be delivered to the yarn carrier separately, and by carrying one bobbin on the machine prevents tangling. Two separate holes are used in the yarn carrier; the yarn desired on the face of the goods is allowed to pass through the first hole, which is higher, while the cheaper yarn desired for the inside is allowed to pass through the second hole, which is as near the bottom of the carrier as possible. The farther apart the yarns are when delivered to the needles, the better the result will be. It may be found necessary to put a slight tension on the surface yarn to prevent it from turning and throwing the yarn the opposite way from that desired.

There are many knitters, and in fact buyers, in the country today who cannot determine a pure worsted stocking from one made of 80/20 merino yarn in the bleached condition without submitting them to chemical test. While a manufacturer may use this yarn in making his bleach goods for a time, sooner or later the trade will learn they are not getting a pure worsted garment and the result will be a falling off on the sales. Yarn for bleached white costs more per pound as stated in my first article, therefore, some manufacturers use this method to equalize the cost of bleached goods with the cost of colors, whereas, if a good article is desired, it is best to use pure worsted. The writer has the personal knowledge of one manufacturer some years ago who made considerable of these goods. By experiments in the treating of a good grade of mercerized yarn, with a solution of benzine and paraffine, he obtained a very nice appearing yarn and substituted this for the spun silk in the tip; the result was that when the trade finally became "wise," the manufacturer lost the trade, and for a long time buyers were suspicious no matter how good an article he offered for sale.

# Dyeing, Bleaching and Finishing.

## BLEACHING ABSORBENT COTTON.

BY WILLIAM B. NANSON.

Absorbent cotton is cotton fibre reduced to first principles, that is to say, it is the cotton fibre with all extraneous matters removed until nothing remains but pure cellulose, $C_6 H_{10} O_5$. The matters found in cotton and which are to be removed are:

| | |
|---|---|
| Oils and fats soluble in ether | 0.75 per cent |
| Coloring matter, etc., soluble in alcohol | 0.40 per cent |
| Coloring matter, etc., soluble in caustic soda | 6.15 per cent |
| Coloring matter soluble in chlorine | 0.78 per cent |
| Mineral matter (silica, etc.) | 0.12 per cent |

It is understood by this table that cellulose (absorbent cotton) may be prepared from the cotton fibre by first extracting the fatty constituents with ether. The residue is then treated with boiling alcohol to dissolve the coloring matters. It is then boiled with dilute caustic potash solution, washed and treated with chlorine water. After this it is thoroughly washed in water and dried, the result is a pure cellulose. This is the laboratory way of producing absorbent cotton, but is far too expensive for an ordinary commercial product and therefore we remove the matter which prevents the cellulose from being absorbent and the brown color which prevents it from being white by boiling it with dilute alkalis and acids, treating it with hypochlorites, repeating these processes if necessary and thoroughly washing and drying. Of course, it is better, but needlessly expensive, to first extract the material with hydrocarbon solvent, ether, alcohol, bisulphide of carbon, etc., as is done today by some absorbent cotton bleachers, to remove the fats and waxes, but this treatment doesn't effectually eliminate the mineral constituents, although they may be reduced to 0.02 per cent. If ash-free cellulose is required, as in the finest filter paper, the material must first be treated with hydro-fluoric acid to dissolve the last traces of silica.

In many places, more especially on the continent of Europe, cotton is made absorbent without destroying the coloring principles, but by removing only the fatty and waxy constituents. To accomplish this the stock is treated with petroleum ether, bisulphide or tetrachloride of carbon, or even a simple alkaline treatment without going so far as to bleach the fibre, and therefore it must be borne in on the mind of the reader, that cotton can be made absorbent without being bleached and inversely—that it can be bleached without being made absorbent.

The cotton fibre is a simple ribbon-like thing tapering and closed at one end, whilst the other end, by which it was attached to the seed is much wider and irregularly torn. It is opaque, always more or less spirally twisted, with thickened side walls and irregular markings on the surface. The fully developed, or ripe cotton fibre, is tubular, during the process of ripening the tube collapses, and at the same time becomes spirally twisted. The central canal frequently contains granules. Unripe fibres, which are known as dead cotton, are also ribbon-like, but much wider than ripe cotton, more transparent, flatter in appearance, and irregularly folded. They possess no central canal, they exhibit little affinity for coloring matter, and they cannot be made absorbent. When absorbent cotton is made with care it will absorb about twenty times its weight of water and the official government test of its absorbing is: that five grammes of it (dry) rolled up into a tight ball between the hands, shall completely sink in cold water in 24 seconds.

The choice of the cotton used has an important influence on the quality of the finished product. For the higher classes of sterilized, medicated cottons New Orleans and "Benders" of the medium grade are the best, but for all

ordinary and cheaper grades of absorbent cotton Peeler comber waste and various grades of Linters are the most reliable and commercially admissible. Cotton card wastes, fly and other low grade wastes are used, but are not advisable. The use of this low grade reworked stock involves heavy souring in the bleaching process which is a deleterious thing as I shall show later on. The asceptic process of absorbent cotton is controlled almost entirely by the degree of purity of the cellulose. The majority of the impurities natural to the cotton fibre are organic matters which are much more susceptible of giving rise to fermentation products and very much less resistant to various reagents, making them more liable to putrification than cellulose, which possesses negative chemical properties. When making absorbent cotton the finished product should be odorless, insoluble in ordinary solvents and tasteless.

The whole secret of successful absorbent cotton bleaching is *time—plenty of time.* If we are to have a soft, pliant, strong fibre that will stand up well and lend itself to easy carding and a consequent smooth and sightly finished product, fulfilling all the requirements of an official inspection, the slogan must be—*give it time.* It must be subjected to prolonged boiling in weak alkalis and a long steep in weak hypochlorites, for, the bleacher must always bear in mind that a long steep in a weak liquor makes for better and more economical results than a short steep in a stronger solution. Time makes for economy of bleaching materials, it makes for a better and more permanent white, and it makes for a stronger and more resilient fibre.

Quick bleaching, either by short boiling in strong alkalis or excessive heat induced by high pressure kiers, or strong solutions of chloride of lime is apt to tender the fibre by superoxidizing the fibre into oxycellulose, this makes it tender and friable, and harsh, and causes a tremendous waste in the lappers and cards.

Cotton may also be converted into oxycellulose during boiling with caustic soda, especially when parts of the goods become dry, but if due caution is exercised to provide for the exclusion of the air, caustic soda solutions, of the strength usualy employed in the boil, do not appreciably affect the cotton fibre. Care must, however, be always taken to run water into the kier immediately after the boiling lye has been run off in order to prevent the cotton from becoming dried on the sides and top of the hot kier and the consequent conversion of it into the friable cellulose.

Cotton may be boiled in strong solutions of the alkaline carbonates (soda ash, etc.) without any appreciable ill effects and without any danger to its strength, it is, therefore, indicated that soda ash rather than caustic soda is the best and safest thing to use.

Thorough treatment in an alkali is imperative as the absorbent properties of the fibre are dependent upon the saponification and removal of the fatty and waxy materials naturally contained in the raw material.

Increasing the pressure during this process, which means increasing the temperature of the boil, is not advisable with absorbent cotton; true, it would lessen the time necessary to boil about four hours perhaps, but it would also lessen the weight of the finished product and impair its strength. Cotton will lose about five per cent when boiled for twelve hours in a one per cent solution of caustic soda at low pressure; the same cotton will lose eight per cent if boiled six hours at a pressure of two atmospheres.

Powerful oxidizing agents also convert cellulose (absorbent cotton) into oxycellulose with a consequent tendering of the fibres and in no case is this so strongly and clearly illustrated as in the action of strong chloride of lime upon it, especially when there is exposure to the air after impregnation with the bleaching liquor. A solution of chloride of lime, only contains a little free alkali, which cannot in any case exceed one gramme per litre. The alkalinity is, therefore, comparatively small and can easily be neutralized with the carbonic acid of the atmosphere. As soon as this happens, hyperchlorous acid is liberated by further action of carbonic acid, and also by hydrolysis; this goes on until the free lime is reduced to a certain point when the action is removed until sufficient lime has been liberated to establish an equilibrium. Very small changes in the quantity of free lime present are sufficient to upset the conditions of equilibrium, and hence the liabiliy of the process to get out of control, or the necessity for the addition of lime water. The greater acidity of the liquor, the more rapid is its bleaching action, and the greater, therefore, the danger of over bleaching with its consequent formation of oxycellulose and tender fibre.

Solutions of hypochlorite of soda have many advantages over the corresponding hypochlorite of lime. In the first place, the salt is readily soluble in water, and can, therefore, be easily washed away with water alone, thus saving the use of an acid bath.

Fabrics which come out of a bath of chloride of lime contain a lime soap,—pectate of lime. If this pectate of lime be not decomposed by an acid bath (sour) and the fabrics in this condition, lye boiled, the stability of this lime soap will be increased and the result will be negative. Hypochlorite of soda does not present this same disadvantage because the salts which it forms with its coloring principles are soluble and can be washed out; thus saving the time, trouble and expense of souring.

Then again a solution of sodium hypochlorite hydrolyses much more readily than lime, and thus there is more alkali in solution owing to the greater amount of alkali present, more carbonic acid is required to reduce it and therefore the bleaching action of the solution is developed more slowly and is more readily controlled, and the danger of over bleaching thus reduced to a minimum.

### SODIUM HYPOCHLORITE.

Sodium hypochlorite, prepared either by electrolysing a solution of common salt, or by decomposing bleaching powder with sodium carbonate, or by dissolving liquid chlorine in a solution of caustic soda or soda ash can be made to take the place of the ordinary bleaching powder solutions, without materially altering the usual methods employed in the bleachhouse. In addition to the advantages already enumerated, such solutions penetrate the material more readily and as they give a softer and fuller bleach than chloride of lime they are more applicable for bleaching absorbent cotton; and, to repeat, there is less danger of tendering the fibre, it requires no souring, a simple washing in cold water sufficing; the goods finish softer and heavier in actual weight, they card better and with less waste, the fibre is stronger and in fact more desirable in every way than goods bleached with chloride of lime with its souring and washing operations.

When a solution of common salt is electrolysed the electro negative chlorine ions migrate toward the positive electrode (or anode) while at the electro negative electrode (or cathode) there is an accumulation of the electro-posi-

tive sodium ions. The sodium which collects at the cathode instantly reacts with the water, however, forming caustic soda and hydrogen gas, which latter, being practically insoluble in water and very light, escapes as such. The chlorine, on the other hand, collects at the anode. Now if the electrolysis of the salt solution is effected without a diaphragm and the electrodes are placed in close proximity to each other, the chlorine does not escape, but reacts at once with the caustic soda formed at the cathode, producing sodium hypochlorite and sodium chloride, thus:

$$2\,N_a\,O\,H + Cl_2 = N_a\,OCl + N_a\,Cl + H_2\,O$$

It is essential, however, that during the process the temperature should not be allowed to rise much, otherwise the reaction would take place in a different sense, and chlorate of soda (which is of no value as a bleaching agent) would result in place of the hypochlorite. Thus by using one of the various forms of apparatus for the production of the electrolytic bleaching solution the bleacher is enabled to dispense with the use of bleaching powder altogether, using in its place a solution of common salt, which is rendered effective by simply being passed through the electrolyser. A clear solution of hypochlorite of soda is thus obtained which does the same work as bleaching powder.

When brine or salt can be obtained cheaply and cheap water power is available, there is no question that these electrolysers will be found effective and economical as compared with chloride of lime, but under all ordinary conditions of working their adoption by bleachers has not at present made much headway, except perhaps by laundries and knit goods bleachers, because they do not offer any peculiar advantages so far as cost of production is concerned over the old fashioned bleaching powder process, cost of plant, wear and tear of electrodes, and loss of unchanged sodium chloride all being contributing factors to militate against the general adoption of the electrolytic process.

Any claim that electrically prepared hypochlorite solutions are any more effective than chemically prepared solutions of chlorine of equal strength are purely imaginary. It is true, that it may be shown experimentarily that electrolysed brine may bleach more rapidly than the chemically prepared hypochlorite from bleaching powder, but this difference is more apparent than real and may be accounted for by the fact that the electrolytic bath is neutral, while the hypochlorite of soda solution is alkaline, and further, by the presence in the electrolyser of a large excess of sodium chloride, (and I will say right here, that while this tends to make the electrolytic solution more energetic and rapid in action it possesses no advantage so far as ultimate results are concerned) the finished white is no better, moreover, it possesses this distinct disadvantage, that its neutrality, or, the presence of undecomposed sodium chloride make the solution very unstable and it will not "keep."

I might add, also, that the addition of sodium chloride (common salt) to chloride of lime in the ordinary bleaching process will have precisely the same effect—its bleaching activity will be greatly enhanced at the expense of its stability.

Sodium hypochlorite made by dissolving liquid chlorine in caustic soda or soda ash is a new thing and may possess merit, the writer has not tried it, but it looks as though there were too many snags to be avoided in its preparation for a mere mortal (such as are usually found in our bleachhouses) to become very efficient with it. I give the process in the words of the producers and I believe it is in successful use:

10 pounds 58% soda ash.
4 pounds caustic soda, 74 or 76%

This is dissolved in a barrel in 40 gallons of water and 5 pounds liquid chlorine run in slowly. Care must be taken not to run the chlorine out too fast. When this is done the expansion of the gas at the valve has a refrigerating action, causing it to condense and "freeze" on the inside. If this occurs it can be thawed by heating the valve and the pipe passing it from the package with cloths wet with hot water. Usually allow one hour for 5 pounds to run out. The soda solution must be cold, for if the temperature gets above 70 to 75 degrees F., the hypochlorite which is formed begins to decompose and the bleaching strength is low. This is also liable to occur when the chlorine is introduced too rapidly and I would advise using a thermometer to watch the temperature. Care must be taken that the hypochlorite does not come in contact with iron at any point, it not only attacks the iron but decomposes very quickly in its presence. I am inclined to think the makers of this liquid chlorine do but faint justice to their own product, for I fail to see why its solutions, used at the strengths indicated, and as used in bleachhouse practice generally, should either decompose the iron or be themselves disintegrated. The writer can see great possibilities in the product if it were handled right and in fact I believe it is being used with pronounced success.

We come now to sodium hypochlorite prepared by the double decomposition of sodium carbonate and bleaching powder (chloride of lime). This can be made in the bleachhouse to the best advantage in the following manner: Fill a 1,300 gallon tank, fitted with an agitator, one-half full of cold water, start the agitator and throw in 500 pounds of 58 per cent soda ash, allow this to be stirred until dissolved, then run in more water until the tank is three-fourths full, then throw in one drum, about 800 pounds, of chloride of lime, allow the agitator to run for 3 or 4 hours longer, or, until all the lumps are broken up and thoroughly mixed, then fill the tank to the top and let it settle over night. This should give a solution of hypochlorite of sodium, standing about 10 degrees Tw when clear, it will be alkaline and thoroughly stable.

This latter is the hypochlorite solution which we shall advise the use of and to which we refer in the following processes.

The treatment for the removal of all the fatty and coloring constituents of the cotton will involve the use of a kier of suitable size, and I shall recommend one about 8 x 7½ feet that will hold about 1,500 pounds of stock. This kier should be equipped with a ram of sufficient length to lift the bottom iron grates even with the top of the kier to facilitate the unloading of the finished stock. This kier should be furnished with a circulator and pump so as to insure a thorough circulation of the various liquors during treatment, for it is my intention to finish all the operations of bleaching without removing the goods from the kier. We shall wet out, boil, wash, chemic and sour (if necessary) without removal and unless the circulation is perfect very uneven results are likely to occur.

There are two ways by which cotton can be bleached absorbent very effectively and without much handling. The first of these is based upon Pick and Urban's discovery

that cold hypochlorite of soda in the presence of castor oil, exerts a strong disintegrating effect upon the waxy and woody matters of the cotton fibre, completely destroying them without affecting the strength of the cellulose in any appreciable degree.

Much of the impurities and coloring matter in cotton fibres are the dried contents of the inner cells and are, therefore, to be found in the hollow space in the center canal into which a liquid that does not penetrate freely can only enter after repeated exhaustion and compression. Bearing this in mind, Pick and Urban have experimented on the action of oxidizing agents with the addition of capillarising bodies on vegetable fibres. They found that by combining hypochlorites of the alkalis with red oils or some kinds of soaps, solutions are obtained which are able to penetrate dry fibrous substances without any previous moistening, boiling, or exhausting, in a quick and thorough manner. The process also has the surprising and unexpected action, that cotton fibre treated in this manner at the ordinary temperature, are, after a comparatively short action, not only bleached a pure white, but that all adhering particles of woody fibre, leaf, motes, etc., and other coloring matters or impurities are separated from the fibers that become just as soft and pliable as would be the case had they been boiled under pressure in lye for six or eight hours. This excellent bleaching and cleansing effect is due to the capillary action of the bleaching liquid. In a very short time this penetrates into the finest pores and hollow places and between the fibres, and thus on the one hand exercises a quick oxidizing action on the dried cell juice in the interior of the fibre, and on the other hand penetrates between the fibre and its woody covering or case and detaches it, so that it becomes oxidized and softened and easily removed by the bleaching action of the hypochlorite and the subsequent washing operation.

Neutralizing or souring or treatment with anti-chloring agents, is not necessary after bleaching in this way; if the amount of chlorine used has been correct, the hypochlorite will have been completely consumed and any slight residue of sodium salts that may remain in the fibre is easily soluble in the final washing process. The writer has bleached many tons of absorbent cotton with this process as a basic principle and can vouch for the efficacy, but it requires care and skillful handling and a close attention to the many smaller details. In handling proceed about as follows:

To 1,200 gallons of hypochlorite of soda standing at 4 degrees Tw, add 70 pounds of soluble oil—this is the stock tub. Into a kier of suitable size, as given, run sufficient of this liquor to fill it two feet above the perforated false bottom. Then throw in loosely, but evenly, about half the lot of 1,500 pounds of cotton. Then start the pump and pump onto the top of the cotton enough of the hypochlorite of soda liquor from the stock tub to thoroughly wet it. Then throw in the other half of the cotton. Start the pump again and pump the remainder of the 1,200 gallons into the kier. This should thoroughly cover the stock and wet it completely. Do not circulate this liquor, just simply let it lie over night.

In the morning pump the hypochlorite of soda back into the stock tub, it will be found stronger by the Twaddel's hydrometer than before, but weaker in actual chlorine, which shows the fallacy of using Twaddel's hydrometer for chemic tests, therefore, the indigo test should always be used.

Having pumped all the hypochlorite out of the kier, close all valves and fill up with water (do not wash) until the stock in the kier is covered, then add 2 per cent of soda ash (30 pounds) in solution, heat the liquor up and when boiling, start the circulation and boil and circulate for one hour. Wash after this in one water, and chemic again in the same chemic as before, to which has been added sufficient fresh liquor from the mixing tank to bring the strength (tested by indigo sulphate) up to its original degree—4 degrees Tw.—chemic for four hours but do not circulate; run the chemic in at the bottom for a few feet then start the pump and pump the chemic on the top until the cotton is covered. After lying four hours pump the chemic back into the stock tub and it will be found to have lost nothing in strength and is ready to start a new batch with by adding the necessary quantity of soluble oil.

By this treatment the stock requires no souring, all that is now required is to wash and dry. The writer usually runs the kier up once with cold water, runs off, and throws out the cotton which is then runs through a suitable washer, or automatic continuous cotton rinser, which washes and squeezes the stock dry and delivers it, by means of a fan stock blower to the feed apron of the drying machine.

I would say here that I never found it necessary to prepare the stock for the kier by any opening arrangements, peeler combings, raw cotton or linters can be put directly into the kier from the bale, the less it is handled the better. Some low classes of card waste or fly might require cleaning and opening out before bleaching, especially if they had been wound up on the stripping roll at the card.

The other process of bleaching absorbent cotton may appeal to the majority of COTTON'S readers as being not quite so radical. That is to boil the stock in the same kier for 12 hours in a liquor containing two per cent soda, one per cent (58%) soda ash, and ½ per cent soluble oil, wash in a kier and chemic six hours in hypochlorite of soda at 4 degrees Tw. (containing no soluble oil) wash and dry up as before.

The writer never sours absorbent cotton, but some people have an idea that souring is necessary to remove mineral salts, iron rust, etc., and it may have some bearing on the test percentage of ash. The United States Government reports the average proportion of ash from a number of samples tested to have been 1.37 per cent and the pharmacists of Great Britain and Germany declare that absorbent cotton should not yield more than .8 per cent of ash.

If souring is practiced at all, the acids used should be sulphuric for hypochlorite of soda and hydrochloric for chloride of lime. If sulphuric acid is used with lime, it will deposit an insoluble sulphate of lime on and in the fiber which will greatly increase (instead of decrease) the ash content, and yet this is the acid nearly always used.

For all ordinary absorbent cotton put up in pound (or larger) rolls, the processes given are all that are necessary, but if the goods are to be antiseptic they will require sterilizing. This is done under a 20 inch vacuum in a steel tank holding 2,000 pounds or more of cotton and is carried on for two hours with formaldehyde.

In a later article I will give an account of the mechanical details necessary to card the cotton after bleaching and roll it up into merchantable packages.

# Notes About Men You Know.

D. G. Breheny has resigned his positinon as overseer of spinning at the Merchants' Mills of the Dominion Textile Co., Montreal, Can., to become superintendent of a hosiery mill near Yorkville, N. Y.

J. S. Chastain, overseer of the cloth room at the Panola Mill, Greenwood, S. C., is recovering rapidly from an operation for appendicitis.

J. B. Harris, overseer of spinning at the Greenwood Cotton Mills, Greenwood, S. C., was elected alderman in his town recently.

J. Edward Newton, who was already a member of the board of directors of the Barnard Manufacturing Company, Fall River, Mass., has been appointed by the directors, managing director, and authorized to represent the board in direct supervision of the corporation's business.

J. D. Watkins has accepted the position of overseer of spinning, winding and twisting at the Prendergast (Tenn.) Mills.

Bertram Goldberg, who until recently was located at Utica, N. Y., has moved to Brooklyn, N. Y., to take the position as textile expert at the Brooklyn factory of Julius Kayser & Co.

R. P. Clark, formerly overseer winding and spooling in the Majestic Mill at Belmont, N. C., has accepted a position in the Louisville (Ky.) Cotton Mill, with C. M. Poore, who is now superintendent there.

Thomas A. Fernley, who has terminated his connection as superintendent with the Bristol Mill, New Bedford, Mass., was tendered a complimentary dinner on Saturday, March 6, by the overseers and second hands of the mill. William P. Covill, treasurer of the mill, paid a graceful tribute to Mr. Fernley's ability and service to the company. He has been succeeded by Joseph Coldwell.

J. F. Pennington, formerly superintendent of the Raeford (N. C.) Mfg. Co., has accepted a similar position at the Ozark (Ala.) Cotton Mills.

L. C. Langston has resigned as overseer of carding at the Prendergast Cotton Mills, Prendergast, Tenn., to accept a position at the Warioto Mills, Nashville, Tenn.

Gilbert Bell has been promoted to second hand in the carding department of the Nottingham Mills, Providence, R. I.

G. Gunby Jordan, president of the Eagle and Phenix Mill, Columbus, Ga., was painfully but not seriously injured while playing golf recently. He was accidentally struck in the face by a club swung by his son, Curtis Jordan.

Howard O. Sturges, of Sturges & Gammell, cotton manufacturers, was elected president of the Narragansett Electric Lighting Co., of Providence, R. I., at a meeting of the board of directors of that corporation.

William G. Nichols, formerly of the Maryland division of the Consolidated Cotton Duck Co., Baltimore, Md., and more recently associated with the mill management department of Lockwood, Greene & Co., Boston, has been appointed general manager of the Griffin Manufacturing Co., and Rushton Cotton Mills, Griffin, Ga. Mr. Nichols has had long experience in cotton manufacturing, and is well equipped for the responsibilities of his new position.

Thomas Morrison, formerly of Holyoke, Mass., is now overseer of ring spinning at the Aretic Mill, Aretic, R. I., succeeding Mr. King, who retired.

Frank Cuddy has succeeded James Harrison, resigned, as superintendent of the spinning department of the Utica (N. Y.) Knitting Co. Mr. Cuddy resigned a similar position with the Walcott & Campbell Spinning Co., New York Mills, to go to Utica. Former Assistant Superintendent Braney has been made superintendent for Walcott & Campbell.

Lewis W. Parker, who recently underwent a severe operation at Johns Hopkins Hospital, Baltimore, is much improved. A second minor operation has been performed, which Mr. Parker stood well, and it is now said that he is on the road to recovery and expects to be able to return home early in April.

J. D. Hollingsworth, master mechanic at the Marlboro Mills, McColl, S. C., is on a visit to Taunton, Mass.

J. W. Hayes, of Troy, N. Y., has succeeded Richard Hennessey as boss knitter for the Union Mills at Catskill, N. Y.

James Steere of the Boot Mill, Lowell, has engaged with the Jenkes Spinning Co., as overseer of carding.

W. D. Ingle has resigned as superintendent of the Richland Mills, Columbia, S. C., and accepted the position of overseer of weaving at the Olympia Mills of that place.

Frank Clark has returned to his former position as overseer of weaving at the Lydia Mills, Clinton, S. C.

W. O. James has been promoted from designer at the Olympia Mills, Columbia, S. C., to superintendent of the Capital City Mills of that place.

W. F. O'Pry of Danville, Va., has accepted the position of overseer of carding at the Prendergast (Tenn.) Cotton Mills.

G. W. McNealy, superintendent of Fort Mill (S. C.) Mfg. Co., No. 1, has also been made superintendent of Mill No. 2.

Charles A. Taylor, lately of the Stark Mill, Manchester, N. H., has become overseer of the cloth room at the Knight Mill, Natick, R. I.

G. F. Gedings has been promoted to the position of overseer of the cloth room at the Middleburg Mills, Batesburg, S. C.

P. D. Fortune has resigned as president of the Union Cotton Mills, LaFayette, Ga.

W. B. Bell, of Charlotte, N. C., has returned to his former position as secretary and treasurer of the Jackson Mill, Monroe, N. C.

D. T. Bagwell has been transferred from superintendent, of the Capital City Mills, Columbia, S. C. to a similar position at the Richland Mill of that place.

J. F. Mims has resigned as overseer carding at the Manetta Mills, Lando, S. C., to become overseer carding and spinning at the Fort Mill (S. C.) Mfg. Co., No. 1.

J. W. McGee has resigned as second hand in carding at the Arcade Mill, Rock Hill, S. C., to become overseer carding at the Elberton (Ga.) Mfg. Co.

L. O. Bishop has resigned as overseer of weaving at the Arkwright Mill, Spartanburg, S. C., and accepted a similar position at the Nokomis Mill, Lexington, N. C.

FRANK GARDNER who recently resigned as superintendent of the Suncook (N. H.) Mills, has been appointed agent of the Quinebaug Co., Danielson, Conn., having been elevated from the position of superintendent.

A. O. ANDERSON, overseer of carding and spinning at the Fort Mill (S. C.) Mfg. Co. No. 1, has been transferred to a similar position at Mill No. 2.

J. F. CUNNINGHAM has resigned his position with the Fulton Bag and Cotton Mills, Atlanta, Ga., to become superintendent of the Bibb Mills No. 2, Macon, Ga.

J. H. Neal, of Cherokee Falls, S. C., has accepted the position of overseer of spinning and spooling at the Elberton (Ga.) Mfg. Co.

C. R. RIDDLE of Columbus, Ga., has returned to his former position as overseer of weaving at the Granby Mills, Columbia, S. C.

ANDREW J. CURRIER, agent of the Nonquitt Spinning Company, was appointed agent of the Warren Manufacturing Company, March 9. Mr. Currier has been in the cotton mill business in various capacities since he was a boy. He was with J. H. & J. Chace, Albion Company and Arnold B. Chace, of the Valley Falls Company, for 33 years, with the Kilburn Mills, New Bedford for two years and in his position with the Nonquitt about nine years.

John O'Neil, Sr., formerly overseer of the mule spinning department at the Pontiac (R. I.) Mill, recently took up duties as second hand in the mule room at the Royal Mills, Riverpoint, succeeding Fred Lajoie.

A. C. ALLGOOD has accepted the position of overseer of carding and spinning at the Durham Hosiery Mill No. 6, Durham, N. C.

G. E. FOSTER has resigned as second hand in the cloth room at the Massachusetts Mill, Lindale, Ga., to become overseer of the cloth room at the Huntsville (Ala.) Cotton Mills.

G. R. BROOK, carder and spinner at the Imperial Cotton Mills, Eatonton, Ga., has taken charge of the weaving, replacing H. L. Joy, resigned.

W. H. THAYER has severed his connection as paymaster at the Tremont & Suffolk Mills. Charles B. Winters, who has had charge of one of the cloth rooms for a number of years, is taking his place.

RICHARD N. DUGDALE, shop foreman at the plant of the Jenckes Knitting Machine Co., Pawtuckett, R. I., for the past four years, was presented with a large Morris chair at the completion of his duties last Saturday, by his fellow employees. Mr. Dugdale resigned his position with the Jenckes concern for a more lucrative position as superintendent of the Standard Machinery Co. at Auburn, R. I.

A. R. SIMS has been promoted from loom fixer to second hand in weaving at the Ottaray Mills, Union, S. C.

GUS WARREN, master mechanic at the National Yarn Mill, Belmont, N. C., will also have same position with the Majestic Mill.

F. C. Dumaine, treasurer of the Amoskeag Manufacturing Co., Manchester, N. H., is planning an extensive trip to California, and will visit the exposition at San Francisco.

RICHARD BOOTH, superintendent of the Swansea Dye Works, accompanied by Mrs. Booth, is in Florida, on account of ill health.

VERNON MCCLOUD has resigned as overseer of spinning and winding at the Armon Mfg. Co., Mount Holly, N. C., to accept a position as carder and spinner at Mill No 3, Lancaster, S. C.

CLARENCE E. BENSON is the new superintendent of the Booth Manufacturing Co. of New Bedford. Mr. Benson has held a number of responsible positions, having been with the Berkshire Cotton Manufacturing Co., of Adams, Mass., for 14 years as overseer of spinning and assistant superintendent of the big plant under Z. D. Hall. He was also superintendent of spinning at the Arlington Mills, Lawrence, for six years.

P. V. MABRY has been promoted from overseer of weaving at the Martel Mills, Egan, Ga., to general overseer of weaving at all the mills of which H. G. Dresser is general superintendent.

W. D. MCDONALD has resigned his position with the Springfield Mills, Laurel Hill, N. C., to become assistant superintendent of the Hamer (S. C.) Mills.

J. H. HULL has resigned as overseer of weaving at the Arcade Mills, Rock Hill, S. C., to become superintendent of the Elberton (Ga.) Mfg. Co.

W. F. HUNNYCUTT has been transferred from overseer of spinning at the Clara Mill, Gastonia, N. C., to a similar position at the Dunn Mill of the same place.

V. M. JOHNSON, formerly salesman for the Hawley's Laboratories, of Charlotte, N. C., has accepted the position of superintendent of the Carolina Mills, Greenville, S. C.

PHIL PROVOST, boss dyer at Somersworth, N. H., was the recipient of a very flattering offer from a New York booking agency for an extended tour through the west in a singing specialty. At the present time Mr. Provost performs at the opera house in Somersworth, evenings.

E. E. BISHOP has resigned as overseer of weaving at the Olympia Mills, Columbia, S. C., to accept a similar position at the Arkwright Mills, Spartanburg, S. C.

W. O. JONES is now overseer of weaving at the Olympia Mills, Columbia, S. C.

HERBERT V. MARTIN accepted the position of superintendent of the Cutler Mills, Warren, R. I., and began his duties last Wednesday. Mr. Martin has had a large experience in yarn mills, and was formerly with Plunkett & Sons' Greylock Mills at Adams, Mass.

WILLIAM BROADFOOT, head cotton dyer at the plant of the Bradford Dyeing Association at Bradford, R. I., has moved from Westerly to Bradford, where he will reside. The people of the latter place gladly welcome Mr. Broadfoot, who has already made a host of friends among the village residents.

JOHN L. BURTON, agent of the Nashawena Mill, New Bedford, Mass., has gone to Bermuda.

W. D. MITCHELL has become master mechanic at the Lois Cotton Mill, Douglasville, Ga.

W. M. SMITH has been promoted from overseer of carding to superintendent of the Cohannett Mills, Fingerville, S. C.

R. T. LEGRANDE, superintendent of the Shelby (N. C.) Cotton Mills, has returned from a trip to New York and Boston.

T. A. MARSHALL, formerly of Danville, Va., has become night overseer of weaving at the Aragon (Ga.) Mills.

CHAS. SKIDMORE, of Charlotte, N. C., has accepted the position of night superintendent of the Tuscarora Mills, Mt. Pleasant, N. C.

# Practical Problems Discussed by Cotton's Readers

**We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so indorsed. This department is open to all. Suitable letters are paid for in cash.**

## NOTICE.

We again wish to call our contributors' attention to the matter of signing their contributions. Unsigned letters for this department find a suitable resting place in the waste basket. Names and addresses are not required for publication, but as a symbol of good faith on the part of the writer.—The Editors.

## ANOTHER OPINION ON CUT WASTE.

Editor Cotton:

Referring to the articles on cut waste, in the February and March issues, I am afreid that "X Y Z A's" practical experience must be very limited or else he was desirous of "starting something." I did not see either the original article or the reply to it, and am basing my opinion on the two articles referred to above.

It may be that there is no cut waste in Michigan, indeed, if the directories are correct, there is very little opportunity for it, but I am from Missouri when it comes to accepting the statement that there is no need of any cut waste in any mill, or perhaps, to state it better, that there is any mill where there is no cut waste made. I have spent over thirty years in cotton mills, starting in as a doffer in a spinning room and working up to a superintendent's position, so that it cannot be said that I have gained my knowledge of the subject from a correspondence school. I have worked in some of the best and most successful mills in the country and I have visited a good many other mills, in addition to those in which I have worked, and I have never been in or known of a mill that did not have more or less cut waste.

Furthermore, I have known a great many practical mill men, but I never heard one claim that they knew of a mill where there was absolutely no cut waste made. This statement applies to waste cut from roving and yarn bobbins, and slasher beams. I was an overseer for five years in a mill where, in addition to other work, I had charge of six slashers, and if there was a set of beams run off during that time, without any waste, I was unaware of it, and this mill is one of the best managed and most successful mills in the country, with the stock quoted at over 80 per cent above par, and no stock to be had, even at that price. Now do not misunderstand my position in the matter. I am not advocating the indiscriminate cutting of yarn from bobbins and beams, but on the contrary, it is an evil that should be continually fought against and the best way to reduce it to a minimum, is to recognize it, and to study its nature and not to delude ourselves into thinking that "there is no sich animal." Perhaps I have been as successful as most men in fighting this evil, but even when there was very little evidence of its being done, I have never been foolish enough to think that I had overcome it entirely. Policemen in the best policed city in the world, do not prevent all crime, neither can the best overseers prevent all cut waste, but it is their duty to prevent all that they can.

Now let us consider why there is cut waste. The first place that we get cut waste is from roving bobbins, and the reason for it is that it is easier and quicker for the speeder tender to cut it off, than to pull it off over the end of the bobbins, and as long as the speeder tenders are required to clean the bobbins, there will be some cut waste from this source. Perhaps "X Y Z A" would have a system to overcome this, but no system has as yet been devised whereby all the roving will run out at exactly the same time, and it is the custom when speeder tenders put roving in the creels, to put in all that are nearly out at the same time, and some of them may have only a turn or two around the bobbin while others will have a layer half the length of the bobbin. There are machines on the market now, which will remove this waste, and if they are as practical as claimed, the remedy for cut waste from speeder bobbins, is not to require the speeder tender to remove the waste, but have the bobbins turned over to some one whose duty it is to clean them on a machine. Of course it is the aim and duty of the overseer to have the speeder tenders run the bobbins as near empty as practical, and it is the duty of the overseer of spinning to have as much care as possible used in doffing. The ends should be all pieced up before the frame is stopped to doff, and the doffers should be careful in doffing, so there will be very few ends to piece up after doffing. They should be taught to piece up properly, neither winding more yarn than is necessary, nor leaving loose ends to get tangled up and cause trouble, and to make good piecings. The less care used at doffing time, the more cut waste there will be at the spooler.

Perhaps this is what is meant by having a system, but it must be remembered, that no matter how perfect a system may be, it will not be carried out perfectly until human nature is perfect, and also that doffing in a spinning room is work can best be done by nimble hands and those of small stature. It does not require very much strength, and consequently it is work that is usually done by boys when they first enter the mill, at an age when they are the most difficult to control, and it is something of a task to get a good percentage of them to be careful in doffing. The greater the success in getting the doffing done carefully, the less cut waste at the spooler.

As to the spooler, it is well known that the spindles revolve at a fixed speed, no matter what the diameter of the yarn on the spools may be, and as a result there is a considerable difference in the surface speed between a spool that is empty and one that is nearly full, the result being that when a spool is nearly full, and a bobbin nearly empty, the bobbin will revolve at a very fast rate of speed, and the strain on the yarn is such that if there is a little weakness in the yarn, or a loose end, or a bad piecing,

or a rough place on the bobbin, or the bobbin revolves with a spiral motion and flies out of the holder, or waste gets into the thread guide, or any little thing happens to put additional strain on the yarn, it breaks, and there is a bobbin with some yarn left on it. If a spooler tender does not have as many spindles as she can run, she is apt to take out the bobbins before they are run out, so as to get another bobbin running, and thus increase her earnings. An overseer should see that the spoolers are in good order, with the speed low enough to reduce the breaks from this cause to a minimum, and that the spooler tenders have all the spindles that they can run, so they will gain nothing by taking out bobbins that are still running, and by these means, reduce the number of bobbins to be cleaned to as low a point as possible, then it will be much easier to get the spooler tender to run the small number that are to be cleaned onto a waste spindle, instead of cutting them off.

Some mills have tried having extra hands to clean off the bobbins, and sometimes it is an advantage, but generally it has been found better to have the spooler tenders clean their own bobbins. There are bobbin cleaning machines that work very well on filling, but it is rather difficult to remove warp waste from bobbins, mechanically, because of the method of winding warp yarn onto the bobbins, and the fact that the yarn which is wound on the bobbin to start up with after doffing, is apt to be wound on in such a way, that it is hard to get it off without cutting. The fact that it is so easy to cut yarn from bobbins tends to increase the amount of waste made; the waste is of less value; and above all, the bobbins are injured, causing bad running work and more waste. Therefore, it is of the utmost importance that this evil should be recognized and fought to the limit in every mill, and the big majority of mill men are, and have been, doing this all the time.

There are a number of causes for waste on the slasher. A slasher set may be from 12,000 to 24,000 yards in length, and no matter how careful the slasher tender may be in adjusting the tension on the several beams in the set, the yarn from one beam may be stretched more than that from the others, so that some of the beams will run out before the others, even if the beams were exactly the same length from the warpers, which is not usually the case. Then again, a warper beam is large, heavy and awkward to handle, and it frequently happens that the outer layers of yarn on a beam will be damaged between the warper and the slasher, and then the slasher tender must unwind all the ends on the beam until the damaged place has been removed, and the ends straightened out, which will mean a number of yards at least, and may be quite a length, depending on how bad the damage was. Also, when an end is pieced up on either the warper or slasher, it is seldom that it can be pieced so as to be the same length as the ends which have not been broken, so that towards the end of the set there may be quite a number ends that are shorter than the others, and as the ends are all wanted on the loom beam, it is better to make a few yards of waste at the slasher than to spoil cloth at the loom.

Every effort should be made to secure perfect work at the spooler, which would reduce breaks at the warper, while the ends that do break should be pieced so as to be as near the same length as the others as possible. The measuring mechanism on the warper should be kept in order, and the beams handled carefully to avoid damage, so that these beams will be as perfect as possible when the slasher tender gets them. Then he in turn should be careful in adjusting the tension on the beams, and if all these points are followed up, the slasher waste will be small.

Slasher waste can be pulled from the beam by hand, and if the slasher tender or helper has time, it is well to have this done, but the difference in value between slasher waste that is cut from the beam and that which is pulled from the beam is very little, unless there is a considerable length, so that it is the custom to allow this waste to be cut off in most mills.

All mill men hope to see the day when there will be no waste cutting done in the mill, and if they are doing their duty they are doing all they can to hasten that day. With the bobbin cleaning machines now on the market, and the improvements that will be made in them, as well as others that will be devised in the future, there is no doubt but what there is a great deal less waste cutting now than formerly, and that there will be still less in the years to come.

I have gone into this matter at length, not for the sake of trying to convince "X Y Z A" that he is wrong, because it is my opinion that he took the position that he did for the sake of argument, and not because he believed it, but to try to point out where to look for some of the causes of cut waste, for as long as there are small amounts of roving and yarn to be removed from bobbins, and operatives who are on piece work are required to remove it, there will be the temptation to do it in the easiest and quickest way, and that is by the knife. Therefore in fighting the cut waste evil, let us do all we can to remove the causes and not charge it all up to the "natural cussedness" of human nature. Occasionally there is a mill manager who claims, (and perhaps believes) that there is no cut waste in his mill, and may point to the fact that there is no cut waste to be found in the waste house since he has been so strict about it, but the chances are that a little investigation would show that there was enough waste going into the toilet rooms and being carried out of the mill in pockets and pails, to make quite a difference in the invisible loss, figured in at inventory time. You will not find the men who have risen from the ranks, making any such claims. If "X Y Z A" can tell us in the pages of COTTON, where there is a mill in which it can be truthfully said there is no cut waste made, I for for one would be very glad to know of it, and to get some points on what kind of a system is in use where such unusual results are obtained.

"Albert" (Mass.)

## BREAKING STRENGTH VARIES.

EDITOR COTTON:

Will some of your contributors kindly give me information in regard to the following questions:

1. What would cause a variation of from 8 to 10 points in the breaking strength of warp, the numbers running from 20's to 30's. Some days the breaks will be at least 10 points higher than those of the preceeding day? I have noticed that one warp on a damp day seems to break higher than on a dry day.

2. In analyzing a piece of mercerized cloth 150 by 84, 27 inches wide when finished, warp 2/48's and filling about

30's, how much contraction in width should be allowed for in the plans to weave a similar piece of cloth? If the same cloth has only 88 by 54 construction in the finished piece will the percentage of shrinkage be any greater? Is there any general rule to follow in estimating shrinkage in width?

X. Y. Z. (Maine).

## USING THE MOTE KNIFE GAUGE.

Editor Cotton:

In the February issue of Cotton I notice "Student" desires information about the angle guage illustrated in the January issue.

I had never seen a guage of this kind used until I thought of the idea and made one to use on cards where an angular adjustment was possible. I had always believed an angular adjustment of the mote knives to be a good feature in any card and had satisfied myself that different angular settings affected the amount of fly and quality of the work. On some makes of cards there is no way of altering the angular adjustment of the mote knives. In such a case as this, the guage will be of no use as all cards of this kind will be alike in this respect. Other makes have only a horizontal adjustment.

As described in my January article, this guage is used to set the mote knives on all cards the same, just as you would set all flats the same. If mote knives on one card are adjusted at a different angle than those on another, it would be reasonably expected that a different percentage of waste would be made on each card. Why should this be the condition in which a number of card rooms are to-day? It is not good management, to be sure. There is one way and one adjustment which for given conditions, will give the best results. The problem is to find what this adjustment is and then to use it. In order to get all cards alike some form of guage is most convenient.

The idea of the angle guage is not my own invention, but was taken from the angle guage used for setting top combs on combers. It is made of brass. A pattern was first made of wood and then the gauge cast. The sketch shown in the January article is full size. The top is filed square and the small hole through which the plumb bob string runs is drilled about ⅛ inch below the base line of the square in line with the vertical line of the square.

To use use it the method is as follows: From experiment determine the proper angle to get the desired amount of fly and make this the standard angle for these conditions. I have found that on some work if the knife was set at 2 on the guage C as shown in January Cotton, it would give good results. On other work I have set at 2⅔. This is something for "Student" to determine for himself.

The angular setting having been determined, the next thing to do is to set the bottom knife to this angle with the top knife out. Why the bottom knife is used is explained in the January issue. Then by means of the vertical or horizontal adjustment set the bottom knife to the licker-in. Then place the top knife in position and set this by the vertical adjustment only. This system followed out will bring every set of knives into the same position on the licker-in and make this adjustment standard throughout the room.

It is not possible to follow this method and use the guage on all makes of cards, but on such cards a guage is not needed.

H. C. Wood.

## FURTHER POINTS ON COMBING.

Editor Cotton:

In the February issue of Cotton I stated that we may increase our comber waste percentage without increasing the quality of the work produced, and not only is this condition possible, but it actually exists in some of our leading mills and in some of our foremost cotton centers.

In changing the time of feeding or nipping, the amount of waste may be increased without increasing the quality of work produced. For example, if the time of feeding has been set so as to commence at the proper time with the delivery or detaching roll moving forward, by changing the time later it is possible that the detaching rolls will have stopped delivering before the feeding has finished, in which case the amount turned forward after the detaching rolls have stopped or the nippers have closed, would be bunched up at the nippers, so that at the next revolution this stock would be held in a bunch at the back of the top comb and would be combed out with the cylinder needles, increasing the percentage of noil without increasing the quality of the work.

The feed roll is feeding forward about 3½ numbers or 14 teeth on the index. Now as the feed roll is feeding about 14 teeth the beginning of the feed must or should be 3½ numbers or 14 teeth earlier than our nipping time, which is, or should be, 9¾ making it so our feeding time should not exceed 6¼.

Please don't misunderstand me when I say the nipper time should be 9¾ as we start closing at 8, and are fairly tight at 9¾, and tight enough to hold paper tight at 11¾ when the first row of needles comes under the knife.

In changing the time of nipping and making it later to increase the percentage, if the timing was already correct for giving best results, which would be with the nipper closing just before the detaching rolls finish detaching, or just before the roll is lifted from the segment, or the segment leaves the roller as the case might be according to the make of machine; then by changing the nipping time later, the nippers would be open at the finish of detaching and the rolls would not make a clean break. This would leave some of the fibers partly drawn out from the lap and not held by the nippers, and these fibers would be combed out by the cylinder needles, thus increasing the amount of waste without improving the quality of work.

The greatest change in the amount of waste taken out can be made in the setting of the top comb, nipper and feed roll. By setting the comb closer to the segment the fibers will be drawn farther into the needles and consequently hold back more of the short fiber and dirt. Setting the top comb at a greater angle will also cause the fibers to be drawn deeper into the comb, giving the same results. Setting the nipper knife closer to the cylinder needles will bring the points of the needles more into the fibers, so there will be less chance for small bunches to pass over the tops of the needles, also the fibers will be drawing deeper into the cylinder needles. In each of these changes, the increasing of noil taken out, increases the quality of the work.

The amount of waste may also be changed by changing the position of the top comb, that is, bring the comb closer to, or farther away from the detaching or delivery rolls. If the comb needles are set nearer to the delivery roll, the waste will be increased, providing the angle of the comb

remains the same; and if set closer to the nipper plate, the amount should be less. In some cases setting the nipper plate and the feed rolls farther from the delivery roll will increase the percentage of waste, but this will not always work the same way. For instance, if the nipper and feed roll are set too close for the length of staple being run, or for the weight of the lap, then by setting wider, the amount of waste may be decreased instead of increased. The reason for this is that if the nippers or feed roll are set too close, it makes the drawing too hard for the detaching roll and the break will not be clean. This will leave part of the cotton at the nippers which should have been carried forward by the detaching roll, and this cotton will be combed out by the cylinder needles.

So you see it is very plain, although puzzling sometimes, that we may close our nippers to get a less percentage of waste and instead of getting less we get more and sometimes we set wider to get more waste and get less.

L. C. (Rhode Island).

## DEPARTMENT SYSTEMS.

Editor Cotton:

I read with great interest the various communications published monthly in your department for practical discussion. There is, however, one subject about which little has been said, and which I believe deserves more thorough discussion. I refer to the cleaning and oiling of the various machines throughout the mill. I should take great interest in reading letters from contributors in different sections of the country giving what they consider a workable schedule for cleaning and oiling the machines in the different departments.

Superintendent (South Carolina).

## FIXING GERMAN LOOPERS.

Editor Cotton:

Every time my copy of Cotton arrives I look to see if there is anything about the German loopers. The looping end of the mill is very important. The looping should be done perfectly, as when any one buys a pair of hose, the first thing done is to look at the seam across the toe.

I am fixing loopers for a big hosiery mill in North Carolina. In finishing a recent order for a few pair over 9000 dozen, there was only 16 pairs rejected from the entire lot. This was a government order, too.

There are two of us doing the fixing, and it takes two men to keep up 154 machines, for this reason: the company decided on a plan over two years ago to put a looper on a box so a small motor of 1/16 horsepower would run it. These machines were distributed around the village and run by married women, some of whom draw $10.00 for a week's spare time work. The company has a wagon that carries the work to these machines and collects it again when it has been finished. The wagon man also gives them a pay check so they don't have to come to the mill for anything.

Naturally it takes a fixer some little time to see all these machines. We know how to keep the strings or clips from hanging, and we use a special needle designed and made by us and believe our needle breakage is very small. We are constant readers of Cotton and we would be glad for anybody to ask us questions. We will answer them as we are not selfish with what we have learned in handling these machines for the last 8 or 9 years. When clippings ball up at the trimmer, these strings often break points, needles, hooks and chain fingers. We keep our repair cost down by keeping these things from being broken, or at least a part of them.

Fixer (North Carolina).

## A QUESTION FOR SPINNERS.

Editor Cotton:

I should be glad to have some of the readers of your Practical Discussion Department explain why the roving has a tendency to wrap around the middle steel roll on a spinning frame. The shells are in good shape.

Y. O. L. (South Carolina.)

## ANOTHER QUESTION FOR SPINNERS.

Editor Cotton:

What are the causes tending to make roving stick to leather rollers on a spinning frame? Is cotton more inclined to so stick after being dyed? I shall appreciate the opinions of the readers of this department on these two questions.

Overseer (North Carolina).

## FINDING THE TWIST ON MULES.

Editor Cotton:

There are many ways of finding the proper twist to be inserted in the yarn on mules. I give two of the most common methods used in the mills.

Rule (1). Divide the number of revolutions per minute of the spindles by the number of inches of stock delivered per minute by the front roll.

Rule (2). Consider the front roll gear a driver and divide the product of the driving gears and the diameters in inches, of the rim of the pulley and cylinder by the product of all the driver gears, and the diameters, in inches, of the cylinder pulley, whirl, and the front roll multiplied by 3.1416 to give its circumference.

Wash (Mass.)

## MORE IDEAS AND EFFICIENCY.

Editor Cotton:

As the author of the article that appeared in the January issue of Cotton on "Ideas and Efficiency," and which was so ably criticized by "Wash" (Mass.), I note that the article met with approval up to the point where I stated that I believed an operative should be paid a wage equivalent to the work performed, but should not be paid when absent from the mills. This is the point on which "Wash" takes exceptions, as he believes it pays best to allow an operative two or three days' wages if he is absent for a legitimate reason such as sickness, or for reasons best known to the overseer or man in charge.

I am afraid that "Wash" has either had little experience in different mills, or else his experience has been in small concerns where the business is run as a sort of family affair. My experience of nine years as an efficiency engineer has

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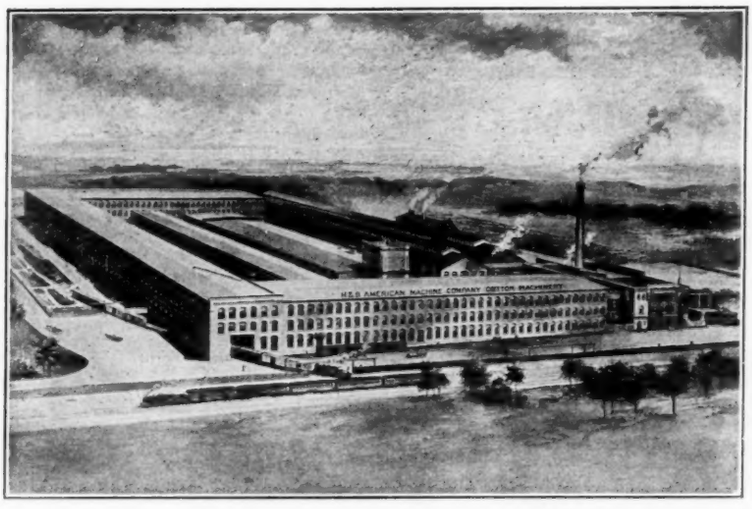
# COTTON MACHINERY

Opening and Picking Machinery

Card Room Machinery



Spinning Room Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

## H. & B. AMERICAN MACHINE COMPANY

PAWTUCKET, R. I.

carried me through some of the largest plants in the country, and I am inclined to think that should the principle of "Wash" be carried out, many concerns would go into bankruptcy. This condition and conditions very similar is the real basis for managers hiring efficiency engineers.

The plan of allowing an operative wages when he is absent with the view of getting more or better work out of him in return is a matter of theory. It doesn't work out and is like the weed that starts in your garden. If not removed it grows and grows and soon covers up the good points of the garden. Likewise, you may mean alright, but the next overseer to you takes up the plan and due to his poor judgment he doesn't stop at the right point. There isn't any more logic in the plan that "Wash" cited than there is in the old fashioned idea that if you raise a man's wages 15 cents a day he will do better work. True, he will, for a week or two, but he soon forgets his good promises and is back in the old rut.

A company runing an up-to-date plant pays for what it receives. Not what theory shows. When you go to your grocer does he give you a pound and one-half of meat for a pound? No. Then why should a mill be expected to pay for what is not done? Also, if an operative is working on a machine that is controlled by the speed of the main line, how in the world is he going to pay the company for giving him three or four days' pay when he was absent? If a man's job is to sweep two rooms and he loafs three days and receives his money, how does he repay the company? Is it by sweeping the room cleaner than before or does he scrub the floor oftener? I don't see any argument in "Wash's" point. It is an accepted fact that the correct way is to pay for what you receive. It isn't a question of what you pay so much as it is *have you received what you have paid for?* I will ask your readers to think this over and add to it the fact that every manufacturing plant in the country, or almost every one, is adopting the plan of scientific management which assures an operative a wage equivalent to the hours worked.

A. M. Oliver.

## MORE ABOUT BUILDERS.

Editor Cotton:

I see in the February issue of Cotton where "Lanes" replies to my article entitled "Builders and Flyers." "Lanes" does not seem to know that on any type of builder where the rocker is changed by springs, that one is obliged to have both twin gears deep in gear for the reason that the play that the change in position of the poker bar occasions is too great, and if not set deep enough, the twin gear will come out of mesh with the twin gear pinion. Therefore, it takes a mighty good fixer to set both gears in mesh the same. This is one reason why the weights were adopted instead of springs.

When "Lanes" states that "If Wash's ideas are the same in all matters, he would have the machine shop larger than the cardroom," he is mistaken. Quite the contrary, for I believe in sending all broken flyers, or flyers out of balance, to a proper shop, but *not* to the mill machine shop. I believe in sending an injured or broken doffer comb to the builder. Also licker-ins that need recovering. I have been superintendent of a cotton mill and I speak from experience as to which pays.

Wash (Mass.)

# New Machinery and Trade Notes.

## A Dangerous Proposition.

Avoid the common drinking cup, for as a carrier of disease germs it leads all death dealing appliances used by the human family. It is stated that one drinking cup can spread more disease in an hour than a board of health can eradicate in a year. The germs which are spread in this manner are often more dangerous than poisonous drugs, because neither to the sight, taste, nor smell is conveyed the

presence of the poison, and because it gives no immediate indication of the injury it has inflicted.

The first agitation for the abolition of the common drinking cup was begun by people interested in the anti-tuberculosis movement who found that the cups on trains frequented by consumptive patrons bound for health resorts in the south-west became infected. The result of their observations lead to the conclusion that other diseases are transmitted equally as well. Bacteriologists have for many years believed that a drinking cup which is used by a large number of persons is inevitably bound to contain bacteria in large quantities in addition to its bits of human skin deposited on the glass by contact of the lips.

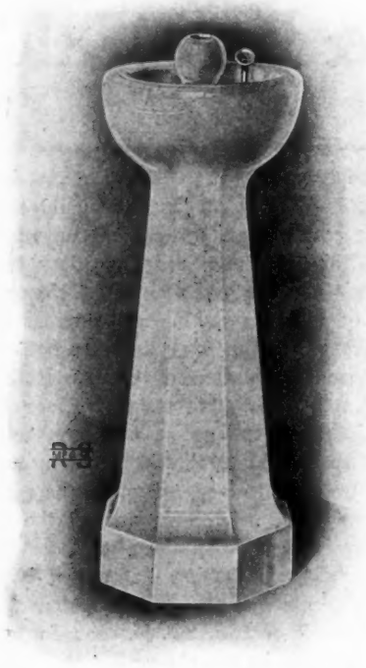
Prof. A. Davison, La Fayette College, Penn., subjected a number of glasses, which had been used from nine days to several months in public schools, to microscopical tests and found literally millions of decaying human cells and bacteria. These included the germs of tuberculosis, pneumonia, diphtheria, tonsilitis and pus diseases. Guineapigs, inoculated from the washing of the cups died from pneumonia and tuberculosis.

The state of Kansas was the first to prohibit common drinking cups. In March, 1909, the Board of Health, at the request of its secretary, Dr. S. J. Crumbine, passed resolutions that no public or private school and no railroad corporation should furnish common drinking cups. In discussing the order, Dr. Crumbine said:

"It is somewhat difficult to definitely trace the origin or source of certain infections diseases, but there is one disease that leaves its mark at the point of inoculation, and it was because of the unmistakable proof of this fact that had been personally called to my attention which made me hesitate no longer in asking the Board to issue the order. It is well known among sanitarians and physicians that syphilis is often conveyed in this manner, but it only took a concrete illustration of a case occurring on a most estimable young woman to bring the matter to a focus. It is also our belief that there have been and will be less cases of contagious diseases in the public schools than ever before since the abolition of the common drinking cup. I might add that now that we know one of the ways the infectious agent, producing infantile spinal paralysis is eliminated, which is through the throat membranes, the wisdom of the abolition of the drinking cup is again emphasized."

Since the Kansas Board took action in March, 1909, thirty-six states and fifty-one principal cities have taken similar action, which makes non-compliance a misdemeanor punishable by a heavy fine or imprisonment.

The health authorities of a few states are hampered in taking definite steps by lack of authority under the law,



but they uniformally advise against the use of the common drinking cup. Secretary Snow of the California State Board of Health, before the passage of a state law, advised public school authorities to destroy all cups and common drinking glasses. In a bulletin to the schools, the Doctor wrote:

"At home children eat and drink out of individual dishes that are washed in hot soapy water between usings. At school numbers of children drink from one cup that may not be washed once a year. When the bell rings for the close of recess a crowd of thirsty, perspiring youngsters rush to the Common Cup some of them have sore lips, bad colds, incipient consumption, or may be feverish from an infectious disease. In all these an undesirable, not to say dangerous, condition may become common property. In many instances schools are closed and lives are lost."

This condition applies as keenly to the mill as to the

# Barrett Specification Roofs

## *Approved by the Underwriters' Laboratories.*

THE Underwriters' Laboratories of Chicago investigates and classifies all kinds of building materials for the Fire Underwriters, and the result of these investigations is used in the consideration of insurance rates and classifications.

In main, its reports cover fire hazards, but its investigations also include: durability, strength, practicability, etc., of the product or material tested.

We filed with the Underwriters' Laboratories a set of claims regarding Barrett Specification Roofs and materials.

Their investigation of these claims, covered several years and included a tremendous work in their own testing plant in Chicago and in the field where a large number of old roofs were visited and studied.

Their report substantiates our claims, as will be seen by the following except:

"Their roof coverings (Barrett Specification Roofs) have been shown by tests and investigations at Underwriters' Laboratories to afford a high degree of fire protection to roof deck; to be not readily flammable and not to carry or communicate fire to any material extent; not to slip from position when heated; to possess little or no flying brand hazard; to exert considerable blanketing influence upon fires within buildings; to be durable under service conditions for periods in excess of 10 years; and to fulfill the requirements for the classification given."

No wonder Barrett Specification Roofs take the best rate of insurance.

Photographs taken after conflagrations and reproduced in the Report show Barrett Specification Roofs with large areas still intact in gutted buildings, constituting, with brick walls and large charred timber, the sole survivors of the fires!

We have accepted the inspection service of the Underwriters' Laboratories at our factories for regular testing of the materials for these roofs as to quality and weight of Barrett Specification Tarred Felt and Barrett Specification Pitch, and henceforth these materials will carry the Underwriters' Laboratories label in addition to our own Specification label.

*A copy of The Barrett Specification, with roofing diagrams, also complete report of Underwriters' Laboratories mailed free on request.*

BARRETT MANUFACTURING COMPANY

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh
Detroit Birmingham Kansas City Minneapolis Salt Lake City Seattle
THE PATERSON MFG. CO., Limited: Montreal Toronto Winnipeg Vancouver
St. John, N. B. Halifax, N. S. Sydney, N S.

school. The microbe is more deadly than the cog-wheel which you will find by comparing your list of accidents with the large number of common "sick cases." So from a purely selfish standpoint, if not from a humanitarian one, sanitary fountains of at least an inexpensive type should be installed in factories and mills where a large number of persons are employed, for every substitute of a first-class operative by a new one means a loss in productive power, which represents a loss in net results. A cool refreshing drink will send your people back to their work invigorated and in a better condition to keep hammering toward the profit goal.

In view of the widespread demand covering, as it now does, the broad area from Maine to California, the manufacture of bubbling fountains is various types has been rapidly developing. To meet this demand, manufacturers are making a great variety of sanitary fountains, meeting the requirements of schools, factories, department stores, hotels, parks, etc. Complete fountains can be obtained from $6.00 up, and one fountain will supply a large number of people. They can be had in self-closing form so no more water is used by this method than in the old way. Two types of these fountains are shown here and a very complete line of sanitary fountains is to be found in a book published by RUNDLE-SPENCE MFG. CO., of Milwaukee, Wisconsin, who will be pleased to send it to you free of cost if you mention COTTON.

## The Reason for Increased Brush Cost.

In order to further acquaint their customers with the difficulty of securing raw material for brushes and also to show why present prices on bristle, hair and fibre are considerably higher than when they sent out their former bulletin in August, the S. A. FELTON & SON CO., of Manchester, N. H., and the D. D. FELTON BRUSH CO., of Atlanta, have prepared the following facts in connection with the brush making industry:

Russia bristle. The majority of this stock is dressed in Poland, near Warsaw, which area has been devasted by three armies. What Russia bristle had been sold at the Leipsic Fair previous to the outbreak of the war, has either been destroyed or held up because of the government's need of transportation facilities for soldiers and foodstuffs. The Russian ports are icebound, and when these are opened exportation will be extremely dangerous owing to the presence of mines and hostile ships in the North Sea. Insurance risks have naturally further increased the prices of raw material in this country.

Horse hair. Practically 80 per cent of the horse hair used in the world comes from Siberia, and again the question of transportation, etc., is similar to the bristle situation. American horse hair is very inferior and scarcely suitable for brush making. In addition to this, South America, which only has been supplying from 10 to 20 per cent of the horse hair used in this country, has been forced to bear the brunt of the trade since last August and naturally can not anywhere nearly meet the demand.

German bristle. The embargo of the German Government has effectually stopped all exportation of bristle and all fine brush materials, camel hair (squirrel tail) badger, sable, fitch hair, etc., the dressing of which Germany controls. All other raw material which has entered Germany is being used by the German manufacturers.

French bristle. Practically all French bristle is raised and dressed in Belgium and Northern France, which localities, like Poland, have been the scenes of many battles. The bristle producing animals are being used for food and no attempt has been made to save the brush supplying properties.

Chinese bristle. The Quality of Chinese bristle is very inferior and is scarcely suitable as a substitute for Russia, German or French bristle. Last year the quality was unusually poor and the supply small, but the fact that so many manufacturers are willing to take what they can get, has and will tend to the exportation of poorly dressed Chinese bristle this year and next.

Tampico. This product, being practically all secured from Mexico, the long continued political disturbances and the uncertainty of business conditions has rendered the supply and the cost very doubtful. The destruction of railways and freight cars seriously affected the supply from the last crop that was coming into this country.

## "Gripwell."

During the past decades, belting was the best-known power transmitting agent, especially leather belting which has the leading position. But there are other good belting materials on the market.

It is an undisputed fact that belting stands more abuse and hard service than any other equipment in a plant, factory, mill or shop and if a little more care and attention were given, it is beyond question that greater efficiency and economy could be effected.

"Gripwell" pulley covering consists of a cement, together with a specially prepared canvas, so treated that while the fibre is not destroyed, it is rendered exceedingly porous and capable of absorbing and retaining the maximum amount of "Gripwell" cement which is applied in a liquid condition. The cement is chemically prepared and is of such a character that it adheres firmly to metallic or wooden surfaces. So firmly does this canvas covering adhere to the face of the pulley, that in a short time, after it has solidified, it forms a homogeneous whole with the pulley.

The results claimed from the use of "Gripwell" is the securing of a surface just rough enough to enable the belt to exert its maximum amount of power without necessitating it being tightened. It is manufactured by the "GRIPWELL PULLEY COVERING CO., 601 Candler Building, New York City, who have just issued an eight-page folder describing their product.

## A Dustless Sweeping Compound.

THE KILDUST COMPANY, Rome, Ga., have completed a large new factory for the manufacture of Kildust, a compound for preventing dust when sweeping the floors of mills, factories, offices and dwellings; also for repolishing hardwood and other polished floors. The manufacturers state that this compound is extensively used where dust proves injurious to the product of factories and mills, as well as to health, where sweeping must be done during working hours. Kildust is packed in 100-pound and 200-pound barrels.

THERE IS
NO RUBBER
IN THE COMPOSITION
OR PRONUNCIATION OF
RU-BER-OID

¶ This great roofing has a good name and deserves to have it pronounced correctly.

RU-BER-OID
PRONOUNCED
"RU" AS IN RUBY
ALWAYS SPELLED WITH
ONE B.

¶ RU-BER-OID Roofing has weathered the storms of over 22 years, and the onslaughts of imitators for almost as long.

¶ RU-BER-OID has been to the South Pole with Captain Scott and to the North Pole or thereabouts with various other explorers.

¶ And to all intermediate points has RU-BER-OID gone—invairably doing what is claimed for it.

¶ KA-LOR-OID (colored RU-BER-OID) is the same durable material with the added attraction of beautiful and permanent colors—Tile red—copper green.

Send for Samples.

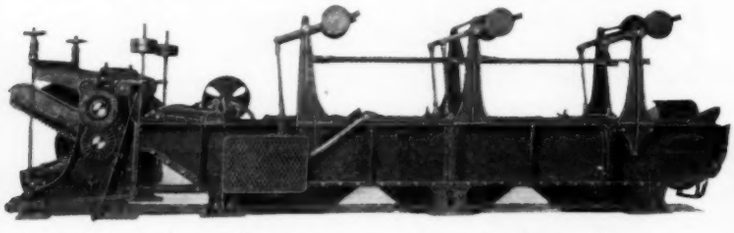
**The Standard Paint Company**

**100 Williams St. New York**

For Leaky Cellars & Pits
IMPERVITE
is GUARANTEED to be Waterproof

## An Automatic Continuous Cotton Rinser.

After bleaching absorbant cotton it is necessary to carefully rinse in clear water and extract as thoroughly as possible before sending the material to the raw stock dryer. A special machine for this purpose is illustrated herewith. This machine is provided with a suitable basin containing water, which is continually introduced, and as continually discharged. It is provided with brass or copper false bottom, extending the length of the bowl, which serves to retain the cotton in the proper compartment while being acted upon by the rake. This rake continuously passes the cotton in an immersed condition from one end of the bowl to the other, to a point where it is acted upon by an auxiliary rake running a greater number of revolutions than the main



rake, which again continuously passes the cotton to a set of heavy pressure rollers, which extract the maximum amount of water and delivers the cotton to a doffer apron, which will pass it on to the next process. Full particulars concerning this machine may be secured by interested persons by applying to C. G. SARGENT'S SONS CORPORATION, Graniteville, Mass., and outlining the work they wish the machine to do.

## The South Leads the Country.

Last month it was shown by figures taken from *Cotton Chats*, the house organ of the DRAPER COMPANY, Hopedale, Mass., that the South exceeded the balance of the country in the use of Northrop looms by a considerable majority. The proportion of Northrop looms compared with common looms is very much larger in the southern states than elsewhere in the country. South Carolina with 78,084 Northrop looms represents nearly 29 per cent of the entire number of Northrop looms in use. In nineteen fourteen 18,901 Northrop looms were shipped to the mills and about four-fifths of these shipments replaced old common looms. The satisfactory manner in which Northrop looms perform the steady continuous duty of turning out cloth from one end of the year to the other is evidenced by the recent report of the manufacturers that they had shipped and on order in the six years from January 1st, 1909, to January 1st, 1915, —132,322 Northrop looms.

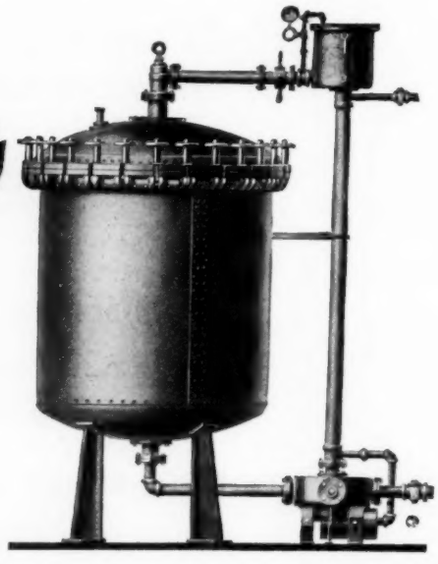
## Announcement.

R. M. Burch and J. M. Hubbard until recently associated with Burch, Bailey & Company, are now active partners with H. W. Valentine in The Cotton Fabric Company, cotton goods commission merchants at No. 43 Leonard Street, New York City. The Cotton Fabric Company are agents for eastern and southern mills, making turkish and huck towels, wash cloths, bath sheets, colored bedspreads, cotton crashes and other cotton merchandise.

## The Rusden Injector System for Kiers.

The call for absorbent cotton is apparently unending. The secret of first quality absorbent cotton is in the proper boiling and handling in the kier. This question of suitable circulation and boiling is, however, not only necessary on absorbent cotton, but equally so on all classes of kier-boiled materials. The illustration shows a pressure kier with the entire top to open, fitted with the Rusden outside injector system of circulation.

By this system of circulation the entire inside of the kier is left free for the goods and a much better and more uniform circulation is provided, which is of great value in properly boiling and preparing any goods for the bleaching



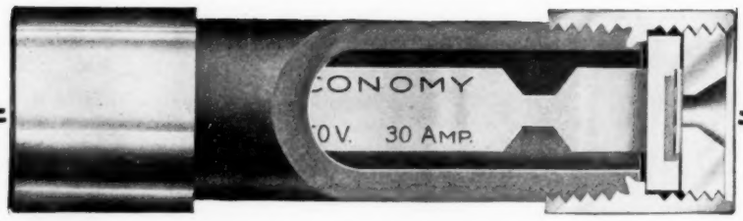
process, and the consumption of steam is much less than by any other system. It is simple and fool-proof, without any complicated valves, which in some systems require the employment of a steam expert.

This Rusden injector system of circulation can be applied to any kind of a kier, both pressure and open, or atmospheric pressure kiers, also to kiers with the entire top to open, as shown in the cut. It is especially adapted for raw stock and handling goods in the bundle, to which kiers a hydraulic lift is frequently applied so that the kier can be conveniently unloaded.

This system is also applied to pressure kiers fitted with the standard 32 inch manhole, especially adapted for handling the great bulk of woven and knit goods which are run in and out of the kier in continuous chains, the ends of the pieces being sewed together.

Kiers fitted with the Rusden injector system of circulation are in use in most of the large bleacheries and finishing plants in the United States and Canada for bleaching woven and knit cotton goods, yarn and raw stock. There has been a large demand recently for kiers fitted with this device, especially designed for bleaching raw stock and linters.

An inquiry directed to THE TEXTILE-FINISHING MACHINERY CO., 171 Westminster street, Providence, R. I., will be given careful attention and detailed information furnished to those interested.




*"The fuses that save 80% per year" are the logical fuses for you to use—*

# ECONOMY renewable cartridge FUSES

are giving positive electrical protection and cutting fuse maintenance 80% in great industrial plants, central stations, mines, department stores, steam and electric roads, etc.

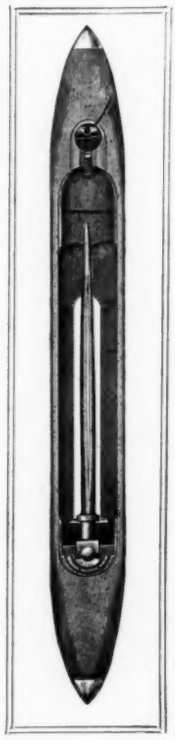
ECONOMY renewable cartridge FUSES are the only renewable fuses uniformly rated—the Economy design is the only design so far produced that provides the desired electrical characteristics. All capacities of renewal elements are readily available, making large fuse stocks unnecessary. ECONOMY renewable cartridge FUSES never vent fire nor hold a sustained arc—they are absolutely safe. Now available in knife blade and ferrule types.

## Special Announcement

Two renewal elements are now furnished (without charge) with each Economy fuse. Now you figure what fuse is the cheapest, not only to buy, but also to maintain.

***Bulletin No. 7 and Samples on Request. Write now***

**Economy Fuse & Mfg. Company,** Kinzie & Orleans Street, **Chicago, Ill.**



# *SHAMBOW SHUTTLES*

Shambow Shuttles help you favor the productiveness of your capital investment and the labor value of your employees by their ability to keep your looms running most steadily. Shambow Shuttles are carefully made and purposely designed to minimize warp and filling troubles due to shuttles.

We are ready at any time to help you work out ultimate shuttle efficiency and supplies economy in your weave room. Get in touch with us by sending one of your worn shuttles and full-wound filling bobbins.

***Shambow Shuttle Company***

***Woonsocket, R. I.***

## Girl Submits to Flame Test.

Being a modern Jeanne d'Arc, says the young lady pictured herewith, is not bad at all, if the business of putting one to the torch, as it were, is conducted under the auspices of modern invention. This young girl offered herself to the flames at the request of a Cincinnati man, who has invented a flame-resisting fluid after eighteen years of thought and experimentation. He applied a painter's flame blast torch to her flimsy white dress and the only damage was a scorching. The fire could not spread. The scorching was in a spot at which the blast was directed. The blast carries 1,650 degrees of heat and is of the variety used to burn paint from buildings. At a second test, which consisted of the inventor firing a bundle of newspapers and then plunging them against her dress it still defied the flame.

The dress had been treated previously to a bath in Anti-Flame fluid. It is odorless and does not stiffen the

goods. Getting to this last feature was the inventor's hardest problem, he says. L. L. Wolf of the Edwards Manufacturing Co. started at work on his invention in company with a college professor, whose daughter had died as a result of her clothing catching fire eighteen years ago.

Anti-Flame, it is claimed, fire-proofs everything from a sheer lace curtain to a hardwood floor. The average bale of cotton can be fireproofed with this wonderful preparation at a nominal cost, and the effect is lasting—without injuring the fibre of the cotton. Curtains, furniture and even clothing can be rendered fireproof in this new way.

At a recent public test of this compound before various Fire and Insurance officials, Chief Bunker of the Cincinnati Fire Department said: "I saw this fluid sprayed on silks, tissue paper, loose excelsior, cotton and excelsior mattresses, lace curtains, theatre scenery of all kinds, oak, pine, cypress and poplar wood, a blow torch was then applied and it proved the best fireproofing test I ever witnessed. none of the different materials burning after the torch was taken away.

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The LINK-BELT CO., Chicago, Ill., have recently issued two new bulletins describing their latest products. Bulletin 207 describes the Link-Belt electric hoist which is an improved and highly efficient hoist intended to reduce handling costs and for saving time. Bulletin 212 describes the Wendell centrifugal coal dyer. This company also designs and builds elevators and conveyors for handling all kinds of material, chain belts, power transmission machinery, etc. They have complete and interesting catalogs describing installations of every kind and description which may be secured on application by stating the particular kind of transmission machinery you are interested in and the use to which you wish it applied.

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## Patent Ownership Sustained.

Some time ago the Supreme Court of the state of New York rendered a favorable decision in the suits brought by the KLAUDER-WELDON DYEING MACHINE CO., against John H. Giles and the Leonard Weldon Estate for the assignment of Patents Nos. 645, 698 and 659,906, from which the defendants took appeal. The Appellate division of the Supreme Court has recently rendered a decision unanimously affirming with costs the judgments previously obtained in these suits.

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## Dyeings on Fabrics with Artificial Silk Shots.

This is the title of a new shade card that has just been issued by the CASSELLA COLOR COMPANY, showing an extensive range of very fashionable shades that will, without doubt, appeal to the fabric designer as well as the dyer and colorist.

In the series of 108 dyeings are to be found many shades, with contrasting effects produced by the judicious weaving of artificial silk, that will at once attract general attention. Several methods of dyeing are described with a degree of competency that leaves nothing to be desired, while the suggestions as to the choice of dyestuffs for both dyeing and shading are very full.

Although the present time may not be opportune to consider dyestuffs, yet it is the alert dyer who is on the lookout for new combinations and color suggestions that takes advantage of such circumstances as the present to prepare for the future.

The present shade card No. 3602 ought to be carefully studied, and dyers and designers of worsteds with artificial shot effects should make inquiry for a copy to any of the branches of the Cassella Color Company.

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A new catalog has just been received from the BOSTON GEAR WORKS, Norfolk Downs, (Quincy) Mass. This catalog, which is 3½ x 6 inches in size, contains cuts and specifications of a great number of the products manufactured by this company with suggestions on ordering. A number of very interesting and useful gear tables are also included. A copy of this interesting and valuable catalog will be mailed free on request if the inquirer will simply ask for catalog E 8, Cotton.

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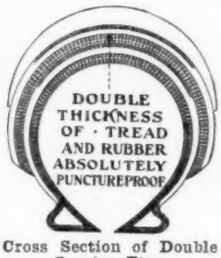
Headquarters for soluble oils, alizarine assistants, turkey red oils, of different percentages for use in finishing, dyeing, printing, etc., as well as sizing and finishing compounds for textile goods, are the offices of THE ARABOL MFG. CO., 100 William St., New York. Their extensive factories in Brooklyn, well equipped with up-to-date laboratories and under expert and scientific management can meet any demand. Their goods have the enviable reputation of being all that is claimed for them.

## Double Service Automobile Tires

**Guaranteed 7000 Miles Service**
**Absolutely Punctureproof.**



Cross Section of Double Service Tire.

**Double Service Tires** are double the thickness of the best standard make tires.

This 100% greater wearing surface naturally gives that much more mileage and service. The average of 12 plies of tough fabric and one inch surface tread rubber makes these tires **absolutely punctureproof.**

These tires excel all others for use in the country over rough and rugged roads as well as on hard pavements. They are as easy riding and resilient as any other pneumatic tire—the air space and pressure being the same.

They are the most economical and "care free" tires made and are used where tires must be depended on and tire troubles cannot be tolerated. Many **Double Service** style tires are in use in the United States government and European War service.

Our output is limited to a certain amount, but for a short time we offer the following reduced special prices as an **Introductory Offer.**

| | Tires | Extra Heavy Tubes | | Tires | Extra Heavy Tubes |
|---|---|---|---|---|---|
| 28 x 3″ | $ 7.25 | $2.20 | 35 x 4″ | 16.80 | 4.60 |
| 30 x 3″ | 8.60 | 2.30 | 36 x 4″ | 17.45 | 4.65 |
| 30 x 3½″ | 10.85 | 3.10 | 37 x 4″ | 17.65 | 4.70 |
| 31 x 3½″ | 11.40 | 3.15 | 35 x 4½″ | 21.20 | 5.60 |
| 32 x 3½″ | 12.75 | 3.20 | 36 x 4½″ | 22.50 | 5.75 |
| 34 x 3½″ | 13.25 | 3.40 | 37 x 4½″ | 23.60 | 6.20 |
| 31 x 4″ | 14.25 | 4.00 | 35 x 5″ | 24.40 | 6.35 |
| 32 x 4″ | 14.90 | 4.10 | 36 x 5″ | 25.10 | 6.55 |
| 33 x 4″ | 15.75 | 4.20 | 37 x 5″ | 26.30 | 6.60 |
| 34 x 4″ | 16.70 | 4.35 | | | |

All other sizes not included in above list also furnished. Non-skids at 10% additional.

**FORD SPECIAL TIRES.—We also have a Ford Special Tire for Ford cars. It is made the same as above tires but the price is lower because of the great demand for these sizes. 30 x 3″, $7.25. 30 x 3½″, $8.70. These bear the same 7,000 mile guarantee. Two or more must be secured at one time to secure these special prices.**

Terms: Payment with order at above special prices, a 10% discount allowed on orders for two or more tires. All personal checks must be certified.

Try these tires and be convinced of their very high qualities. Not sold through dealers.

**Double Service Tire & Rubber Co., Akron, O.**

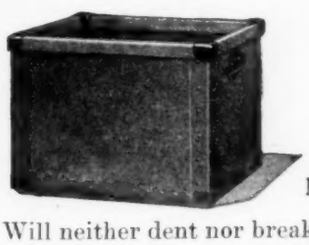
## CHINA CLAYS AND TALCS

Adapted for

**Loading and Finishing**

**DUNN & KRUSE**

MAIN OFFICE, 180 SOUTH ST., NEW YORK



## Diamond FIBRE

ROVING CANS
MILL BASKETS
BARRELS BOXES

Will neither dent nor break when subjected to hard usage. Stronger than wood, lighter than steel.

**Write for Bulletin 13.**

**DIAMOND STATE FIBRE CO.**

**Bridgeport, Pa.** **Elsmere, Del.**

**Branches in Principal Cities.**

## Small Concentrated Filament Lamps.

The distinctive features of the concentrated filament Mazda lamps of high wattages have proved so popular that the Edison Lamp Works of the General Electric Company has developed vacuum Mazda lamps of similar appearance in the 25, 40 and 60 watt sizes. This concentrated filament construction gives greater vertical distribution of light than the regular Mazda lamps of corresponding wattages. The new lamps will, therefore, be employed where natural distribution of light downward is required. They can be used in existing sockets and fixtures. These lamps will be made in the same sized bulbs as the corresponding regular Mazda lamps, will have the same spherical watts per candlepower efficiency and will have a rated average life of 600 hours.

Practically all the sizes and types of Edison Mazda multiple lamps are affected by reductions in list prices that were put into effect April 1st, 1915. On the regular straight side and round bulb lamps, from the 10-watt to the 250-watt sizes, also on sign lamps, stereopticon lamps, etc., the reductions range from 3 to 20 cents per lamp, according to the size.

The new concentrated filament vacuum lamps of 25, 40 and 60-watt sizes now list at only 5 cents per lamp more than the regular lamps of corresponding sizes.

On the gas-filled, multiple lamp of 100 to 1000-watt sizes, the reductions range from 50 cents to $1.00 per lamp, the average reductions being between 20 and 25 per cent. The introduction of gas-filled lamps has been exceptionally rapid. Over a million are already in use. The decreased cost of these lamps will undoubtedly result in a still more rapid replacement of vacuum lamps by the more efficient gas-filled units.

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The Graphite Lubricating Co., Bound Brook, N. J., have a new and handsomely illustrated catalog describing their oil-less bearings. This catalog, which is 7 x 10¾ inches in size, contains 48 pages of special coated stock on which are illustrated and described the various products of this company. Not all the illustrations, however, are devoted to such prosiac things as oil-less bearings and bushings, as one of the splendid half-tone reproductions is a Curtiss by-plane in full flight against a background of a huge cloud bank. One wonders on looking at this picture where the photographer stood to secure it. This also acts as a reminder that the Curtiss Motor Co. use "Bound Brook" bushings in the motors on aeroplanes built by them. Another interesting full page illustration is the United States battleship Vermont struggling with a huge sea. This is from a photograph by Underwood & Underwood and gives a clear demonstration as to the power of the Atlantic's billows. This is not all, however, as the other pages contain illustrations of other battleships among which are those of the Argentine Republic's battleship Moreno and the United States super-dreadnaught Texas. On all of these and many other naval vessels "Bound Brook" oil-less bearings are in use, and these uses are briefly described on another page of this catalog. A post-card or letter to the Graphite Lubricating Co., Bound Brook, N. J., requesting a copy of this catalog which you saw described in Cotton, will bring you a copy for your own personal pleasure and use.

# BOOK REVIEWS

**All Books Reviewed Under This Heading May Be Procured From COTTON at the Published Price.**

Manuel of Industrial Chemistry. Second edition, revised and enlarged. Edited by Allen Rogers, in charge of Industrial Chemistry, Pratt Institute, Brooklyn, N. Y., 1005 pages. 305 illustrations. Published by the D. Van Nostrand Co., New York City. Price $5.00 net.

Over three thousand copies of the first edition of Rogers and Aubert's "Industrial Chemistry," issued less than two years ago, have been sold. This new edition, thoroughly revised and considerably enlarged, is now ready. There have been so very many changes in this volume that it has become practically a new book. Some of the chapters were omitted while ten entirely new ones have been added. Nine of the old chapters were revised and enlarged, and twelve others carefully revised. The entire work was brought up to date and two hundred pages of new matter were contributed by eight new authors, three of whom rewrote chapters of the old book. A large number of illustrations in the former edition were omitted, and the present work contains sixty-two new illustrations. This book, while very well received by practicing chemists, was also found very helpful in the class room, as forty colleges and universities have officially adopted it as a text- book. As a standard reference work this new edition will be welcomed by many practical men, who wish a complete and reliable reference book always at hand in the mill or laboratory.

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Dockham's Jobbing Trade and Department Store Directory for 1915. 82 pages. Bound in paper. Published by the Dockham Publishing Company, Boston. Price $1.00.

This directory contains over 4,000 buyers properly listed. 2,913 jobbers are named with the line each jobbing firm carries given in full. 1,415 department stores are also given. These lists are given alphabetically by states, cities and firms and usually the street and number where located is also stated. To those manufacturers wishing to get in direct touch with the jobbing or department store trade, this directory will prove valuable.

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The February issue of *"Yarns"* which is a magazine devoted to rope and twine, published monthly, by the American Mfg. Co., Noble and West St., Brooklyn, N. Y., contains some very interesting illustrations showing the use of ropes in submarine mine work. Also photographs showing ropes for other uses such as mooring lines, drilling cables for oil wells, etc. One illustration shows a Mexican woman weaving blankets and how she utilizes rope in this operation. A sample copy of this interesting magazine may be secured on request by merely mentioning that you saw it in Cotton.

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Harrisburg.—At the annual meeting of the stockholders of the New Idea Hosiery Co. the regular semi-annual dividend of 3½ per cent was authorized. The company, according to reports, shows an increase in its business of $18,000 last year. The old officers were re-elected.

*Spinning Tape Specialists*

*Established 1898*

Makers of tape for all kinds of tape drives and all makes of machinery. Makers of listings, leaders and all kinds of mill tapes

*Write Us*

BARBER MANUFACTURING CO.

LOWELL, MASS.

are adapted to any style or size of building from workmen's cottages to the finest residences. They are easily and quickly laid, right over wooden shingles if desired.

Let us send you the names of nearby users of Cortright Metal Shingles. No obligation. Write today.

CORTRIGHT METAL ROOFING COMPANY
Philadelphia and Chicago.

# JOHN D. LEWIS

Manufacturer of

# Logwood Extracts & Hematine

## Providence, R. I.

**50% Better than ever from YOUR Standpoint**

SEVERAL NEW FEATURES have been added to the "1912" Cloth Cutting, Folding and Winding Machine which **add at least 50% to its value to YOU.**

It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine. It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two, and you get an **extra** strip from every bolt of cloth.

It cuts the corners of expense in every way and leads to more and greater profits.

THE ENORMOUS SAVINGS WILL INTEREST YOU.

Mail a card for complete information and prices.

When in need of special machinery, write me.

**J. A. FIRSCHING, 614 Broad St., Utica, N. Y., U. S. A., Dept. "C."**

**Clinton H. Scovell & Company**

**Certified Public Accountants**
**Industrial Engineers**

**110 State St.** CHS&C CERTIFIED PUBLIC ACCOUNTANTS MASS AND NEW YORK **Boston, Mass.**

**Textile Cost Accounting**

**WANTED** EVERY MILL in the SOUTH to use **Removoil, Loom Lubrik, Myco Non Fluid Oil and Loom Grease, Disinfectants, Myco Grease Size.**

**MASURY-YOUNG CO., Est. 1857 Boston, Mass.**

**DIXIE SPINDLE & FLYER CO., Inc.**

**Expert Overhaulers and Repairers**

**COTTON MILL MACHINERY**

**CHARLOTTE, N. C.**

**ALUMINA SOAPALITE**
**THE MINERAL SOAP**

**THE DETERGENT WITHOUT AN EQUAL**

Washes thoroughly and quickly—rinses freely. Brightens and sets colors.

**BOOKLET FREE**

**THE ELECTRIC SMELTING & ALUMINUM CO.**

Lockport, New York

## KNITTING MILL NEWS.

**Notices of mill projects, additions or improvements are solicited for this department. Other notices pertaining particularly to the Southeastern section will be found in the Southern Mill Situation review.**

INDIANA.

MISHAWAKA—The Mishawaka Woolen Manufacturing Company, woolen and rubber footwear, lumbermen's socks, etc., is planning an enlargement of its plant to cost about $500,000, and to add about 1,000 operatives to the company's force. A new mill and new office building are to be erected, according to reports, the main building to be 400 by 100 feet, partly four and partly two stories in height, and the office building to be six stories.

NEW JERSEY.

RED BANK—A small knitting mill is to be established at Eatontown, N. J., by Luther Boyce. A building formerly used as a wheelwright shop is being enlarged and improved and machines are to be installed as soon as possible, and operations started on underwear.

CAMDEN—Kline & Adams, Philadelphia hosiery manufacturers, will start a hosiery plant here at 27th street and

NEW YORK.

ALBANY—The Knitwear Manufacturing Co., of New York, has been incorporated, with a capital of $6,000. Harry Glickman, 1181 Eastern Parkway; Nathan Klein, 99 Manhattan avenue, Brooklyn; Jacob Crudberg, 982 Aldus avenue, New York, are the incorporators.

ALBANY—The L. Steppacher Company has been incorporated, to manufacture underwear. Capital, $5,000. Louis Steppacher, 610 West 150th street, New York.

NEW YORK—Julius Kayser & Co., manufacturers of knit goods, have secured a five-story building in Sherbrooke, Quebec. It is believed that this is a move to take advantage of the Canadian market. Julius Kayser & Co. already have plants in Brooklyn, Amsterdam, Hornell, Masonville, Owego and Sidney, N.. Y.

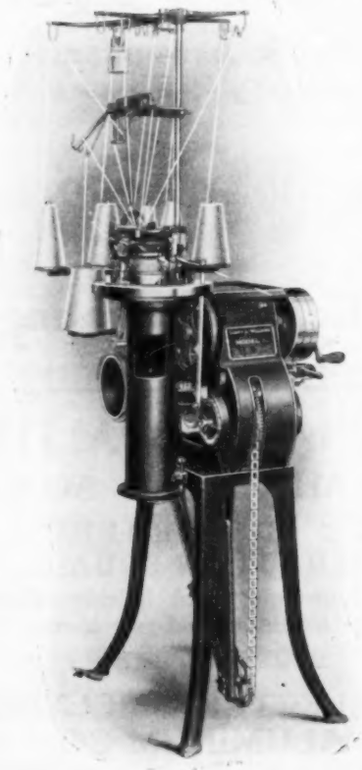
BROOKLYN—The Broadway Knitting Mills have been incorporated for $110,500, the following being named as directors: Audley Clarke, Thomas Forester and Samuel Sheindelman.

PERRY—The Lander & Watson Hosiery Company, which is to move its plant from Perry, N. Y., to Ellicottville, N. Y., during the summer, expects to install about 25 new machines in its new mill when completed, which are to be purchased with the additional capital subscribed to the company. The two-story brick building to be erected at Ellicottville will be 50 by 80 feet, and it is expected to be completed about July 1.

PERRY—The Tempest Knitting Company, men's and boys' cotton balbriggan flat underwear, has purchased a plot of ground on Federal street, adjoining its plant, for the reported purpose of enlarging its facilities.

WISCONSIN.

SUPERIOR—W. A. Whitney, proprietor of the Superior Knitting Mills Co., is planning a considerable enlargement of the company's plant, providing for employment of 50 more operatives. The concern is a new one, manufacturing sweaters, etc., with an equipment of 44 knitting, 2 rib and 72 sewing machines.

# Our Hosiery Machines

automatically set up and drop off each stocking and make the anti-ravelling course, and, in addition to the cost of transferring the cuffs of half hose and the sewing of the welts of women's hose, these machines effect very pronounced savings, for instance—in the case of half hose, the ordinary ribbed machine is eliminated entirely, and, of course, the first cost of this machine, its maintenance and floor space, together with the knitting waste, the cost of cutting the ribbed top and the ravelling waste, which in the ordinary practice is unescapable, are entirely saved.

Transfer menders are altogether eliminated and the expense and annoyance of training expert help is avoided.

In respect of the women's hose there is no expense for severing the stockings, no sewing machine operation and consequently no waste on account thereof and a marked decrease in loopers ravelling waste, due to the fact that the stockings are pressed off to a course and not left with a crooked unevenly cut edge.

**Established 1865.**

## Scott & Williams, Inc.

**88 Pearl Street**
**BOSTON**

**NEW YORK** **UTICA**